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Surveys Bring Out Especially Valuable Information

DESCRIPTIONS of current methods and equipment serve a particularly useful purpose when the best features are thus pointed out and made available for adoption by companies which are doing this work less efficiently. In order to visualize and draw conclusions as to the relative value of different practices it is desirable to have many of them described side by side so that the advantages and disadvantages may be picked out readily. With this idea in mind, the ELECTRIC RAILWAY JOURNAL has planned and is publishing a number of articles giving information obtained through a broad survey of methods and equipment used for performing certain operations or maintaining unit parts of the car, line or track.

A survey of the painting practices used by electric railways was published in the Feb. 24 issue. A survey of the methods and equipment used for removing wheels appeared in the March 17 issue, from which it was possible to draw almost complete conclusions on how gear blanks might be standardized to meet all requirements. A third article dealing with truck overhauling is published in this issue. It is believed that such articles are among the most valuable pieces of work the paper can do. They require a great deal of labor and are very expensive to prepare. They are worth special study by the reader.

Good Savings by Improvements in the Old Shop

IN COLLECTING the information relating to methods and equipment used in truck-overhauling work, special attention was given to obtaining the ideas of foremen regarding needed improvements. If a new shop were to be constructed these men felt that a number of improvements should be incorporated, but there seemed to be a lack of progressiveness in working out savings that could be made in the present shop by adopting better methods and tools. This attitude may be partly accounted for by the experience these men have had in various efforts to convince the management that improvements in the old shop would produce a substantial return on the investment.

Many operating officials consider the shops a necessary expense and look with little sympathy on any proposal to put more money into these facilities. The situation in regard to improvements is better when it comes to building an entirely new shop, for then the management wants to incorporate all the latest methods and equipment. But managements not contemplating new shops may well give special heed to the requests with respect to small improvements in present facilities on the part of their men who are constantly studying mechanical maintenance work, for a dollar saved in the shop is a dollar added to net just as much as though it were a dollar increase in revenue. And there is much room for reducing shop costs on the average road.

For example, changes have been made in old shops that have produced surprising results in reduction of time and labor required in overhauling trucks. One shop installed two overhead traveling cranes to serve the truck shop. One of these cranes operates underneath the other and the supporting runways are entirely separate from the original building construction. Thus the strengthening of the building in general was not necessary. Another shop has installed a system of air and gas piping with convenient outlets. Many pieces of work formerly done with hand tools can now be done by special tools, with a great saving of expense. For example, nuts previously removed with hammer and chisel are now removed by the cutting torch.

Orderliness and System in the Truck Shop

THE truck-overhauling shop of any electric railway is a busy spot. The general impression that one carries away from visits to most of these is one of disorder. Truck parts are found scattered over the floor, grease and dirt are everywhere. To move about one must jump over various parts and the visitor feels much safer at a distance. Is all this necessary? The exceptions prove that it is not. Without doubt one of the least expensive improvements that can be made, and still one that will produce important results, is that of systematizing the work and maintaining an orderly truck shop.

Fix a definite location for performing certain work. Take whitewash and mark off the sections on the floor where the work is to be done. See that aisles and passageways are clearly marked and that this space is not encroached upon by the other overhauling work. Use a liberal amount of sawdust over the floor and have it replaced frequently. Have definite places for all tools and see that they are kept in their places when not in use. Arrange the equipment with the idea of expediting the work and plan the various operations for the convenience of the men who do the work.

Men do more work with less effort if confusion is avoided by convenient arrangement. It takes less time and effort to handle material once than to handle it twice. A little thought may produce a better arrangement, speed up the work, and at the same time produce better work. Is there a chance for improvement along this line in your truck shop?

Concentration of Work a Reason for New Shops

AMONG the older shops, especially those in large cities, the consolidation of properties has given the equipment maintenance department a number of shops of which none is particularly suited to the overall maintenance requirements of the present company. In order to use the facilities to the best advantage with-

out extensive changes, it is a common practice to do different classes of work at the several shops. Thus truck overhauling is done at one shop, wheel and axle work at a second, motor repairs at a third, etc. While this uses the individual shop facilities to the best advantage, still it requires a large amount of handling and transporting of equipment. It also leads to a schedule for overhauling equipment which provides for different parts to be overhauled at separate times. This is inefficient as it requires a duplication of some parts of the dismantling and assembling work. The tendency is to do all overhauling of equipment together with painting and car body repairs at one time.

Thus the plan has been in all recent shop layouts to center at one location all the shop facilities for a property. Where the shop work must at present be done at scattered locations this is an added reason for investigating the saving possible with a new shop.

A Good Workman May, or May Not, Make a Good Foreman

FOREMEN are usually promoted from the ranks, a wide-awake management being always on the alert to detect in the workers those characteristics which are needed for the job higher up. The result is on the whole fairly satisfactory, but there is always a likelihood that a man will be promoted simply because he has been a good workman and has a pleasing personality. These virtues are not enough; in fact, while desirable they are not essential. What is essential is the ability to get men to produce and to work harmoniously. This quality is possessed by comparatively few, and is worthy of careful search.

The growing realization of the importance of the foreman is the cause behind the classes in foremanship which are now so common. The war played a part in this, because the rapid expansion of manufacturing produced an abnormal demand for foremen. They had to be made over night. The state and federal boards of vocational education have also influenced the movement. Elsewhere in this issue is an account of a foreman class held in El Paso, Tex., the results of which are typical of what is being done or can be done almost anywhere. Such undertakings either give the foremen a better appreciation of their opportunity or emphasize their unfitness for it. They also tend to bring out the foreman "timber" among the men.

Will Defacement of Cars Disappear with Finer Materials?

STREET railway men know to their sorrow that there is in every community a certain element which seems to take special delight in defacing and damaging public conveyances. There is no real motive behind this. Such vandals destroy simply for their own amusement, without reason. The tendency in the past has been to forestall this kind of vandalism by sacrificing appearance in favor of indestructible material. Usually it has resulted in a less attractive design if not in one which is actually less comfortable for the passenger. This has minimized the maintenance expense, but it has not prevented thoughtless defacement.

An entirely new thought is introduced by the experience of a Mid-Western company. Some time ago this railway commenced de luxe bus operation. The fittings, finish and equipment were selected with a view to elegance of appearance and luxurious comfort. Deep-cushioned seats were upholstered in genuine leather and nickeled fittings used. Some apprehension was felt concerning the way these expensive trimmings would fare at the hands of the general public. Since the inauguration of this service, however, there has not been a single act of vandalism. On the contrary, the public seems to have taken special pains to preserve these attractive fittings.

Is there not a lesson in this situation for electric railways? If experience shows that a satisfactory and attractive interior cannot be made of indestructible materials, why not make one of such good materials that people will be inspired to preserve their fineness? The use of plush seats in the new safety cars of the Chicago, North Shore & Milwaukee Railroad, noted in last week's JOURNAL, is a step in this direction, but only a step. The interior of the new London Underground cars pictured in the JOURNAL for May 5 carried the idea much further. And one American railway is working on plans for new interurban cars that will be finished with plate glass windows and the luxurious upholstery associated with the limousine. Of course, the primary object in each case is to popularize the service, but it is not too much to hope that at the same time vandalism will not be a deterrent to car development.

Seattle System Did Better in 1922

OF MORE than passing interest is the annual report of the Seattle Municipal Railway for the calendar year 1922, presented elsewhere in this issue.

Beginning with the first day of complete city operation, fares were increased by the elimination of cut-rate tickets. A straight 5-cent fare continued for less than sixteen months, when the cash fare was raised to 10 cents, with tokens sold at four for 25 cents. Within six months, on Jan. 9, 1921, the token fare was raised to 8⅓ cents, which rate continued to the end of the period covered by the report.

When the property was given up by its former owners a deficit had accrued, due in no small part to the refusal of the city to allow an increase in fares sufficient to meet rising costs. The city, however, found it necessary to increase fares several times, and even then had an accumulated deficit to Dec. 31, 1922, of $877,491.

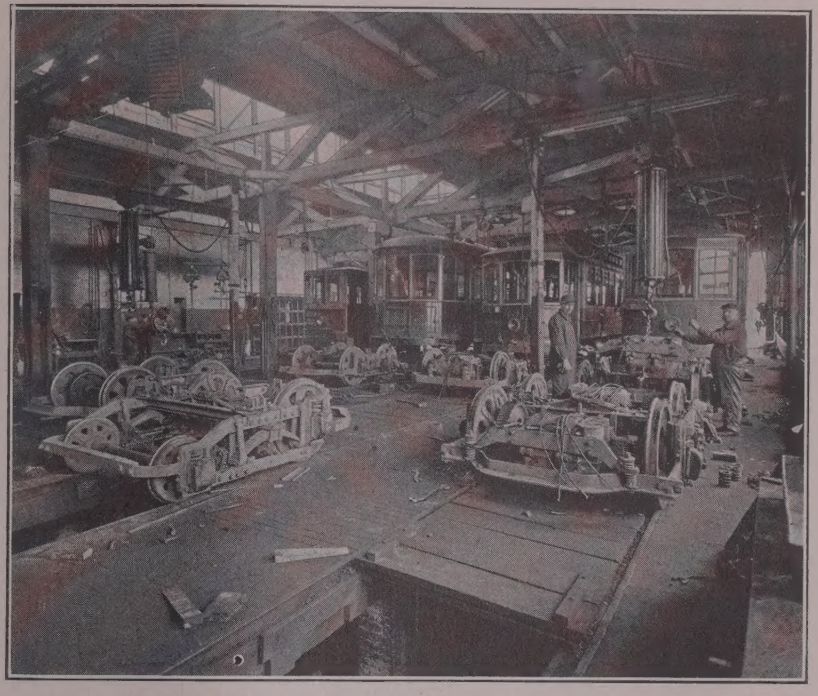
The revenue for 1922 was 1.88 per cent less than in the preceding year, being $6,228,103. This was at the rate of 40.2 cents per car-mile. Figures compiled by the American Electric Railway Association show that in 1922 the receipts of 121 urban railways were 45.7 cents per car-mile on average receipts of 6.7 cents per revenue passenger against 8.3045 cents in Seattle. Operating expenses in Seattle were at the rate of 30 cents per car-mile, which is not especially low with 28 per cent of the service given by one-man cars. The average operating expenses of the 121 roads for the same period were 32.8 cents.

That the company showed a net operating income for 1922 amounting to $761,000 after the payment of bond interest is due in large measure to the immunity from taxation enjoyed by the city-owned railway. Nor was paving a heavy expense, as $69,574 was spent in maintaining paving carried in the capital account at $3,040,218. The amount spent on this item during the year was only one-forty-fourth of the first cost, which would seem to indicate that the paving burden was borne largely by other departments of the city.

Truck Overhauling Methods

The Several Commonly Used Practices in Truck Overhaul Are Described as Result of Survey Covering Fifty Electric Railway Shops—The Best Methods to Be Followed and Most Effective Equipment to Be Used Are Discussed—Overhead Crane Provides Most Efficient Handling

THE instructions which are usually issued to a shop foreman or by shop foremen to overhauling crews regarding the work necessary in overhauling trucks can be summarized in a very few words. In effect, these are that the trucks should be overhauled in such a thorough and efficient manner that they will be placed in the best of operating condition and as nearly as possible in their original condition. For a complete overhauling, this means that the trucks must be entirely dismantled. The various parts which can be repaired again must be sent to the machine shop or blacksmith shop, all excessively worn parts replaced, and finally the trucks again assembled and made ready to be placed under cars for service. The work necessary to be done will vary with each type of truck and also quite likely with each foreman that has charge of the overhauling. Through a survey of the truck overhaul shops of more than fifty electric railways, an effort has been made to point out not only the variety of methods and equipment used, but also the most efficient practices.



Overhauling Trucks in the St. Paul Shops of the New York State Railways, Rochester. Car Bodies Are Lifted by Chain Hoists, and Jib Cranes with Air Hoists Serve the Overhauling Floor

The master mechanic of a small or medium-sized road is often forced to work at a disadvantage. He has to develop men who can be changed efficiently from one class of work to something entirely different. Generally, he lacks modern machinery and sometimes is even compelled to use machines which have been discarded by larger shops as being out of date. He has to modernize these machines as much as possible and devise attachments to make them do work never contemplated by their original designer. Yet, despite these handicaps, these master mechanics are usually required to compete with the car maintenance costs shown by very large shops, and it has been found possible for the wide-awake master mechanic to keep his costs down to remarkably low figures considering his equipment.

No two shops perhaps have the same type of machinery or follow out the same methods in overhauling. The various methods, however, can be grouped into several general classes. The methods described in this article are those which have come under observation of the JOURNAL editors while making a general survey of the subjects and which have worked out to good advantage in the particular shops where they are used.

The proper basis for truck overhauling is something that must be decided by each railway for itself. On medium-sized roads a time basis will no doubt be found most convenient, as these roads can then apportion their work and lay it out in advance so that it will not interfere with other work which the same men may be called upon to do. For large systems a mileage basis will no doubt prove the most advantageous, as it is really the mileage made by the equipment or the service through which the equipment passes that in reality determines its need for repairs. There has been a marked tendency during the last few years, however, to group the various overhauling work so that it can all be done at one time. The work necessary for overhauling the trucks, car body, electrical and brake equipment, together with the painting of a car, is then put on the same basis and all equipment is overhauled at the same time. The interval between such general overhaulings runs from one to two years. On very small systems where the cars are few they really become a part of the family. The various shop men learn their peculiarities and the wear of the various parts and the need for repairs can be readily followed, so that with such roads there is really no necessity for any definite basis of overhauling, and the necessity for doing the work is determined by the foreman or assistant foreman of the overhauling shop.

The work of truck overhauling from the time the car is placed in the shop until it is ready to return to service may be divided in twelve general items. These are: (1) Taking measurements to determine necessary adjustments; (2) disconnecting brake rigging and motor

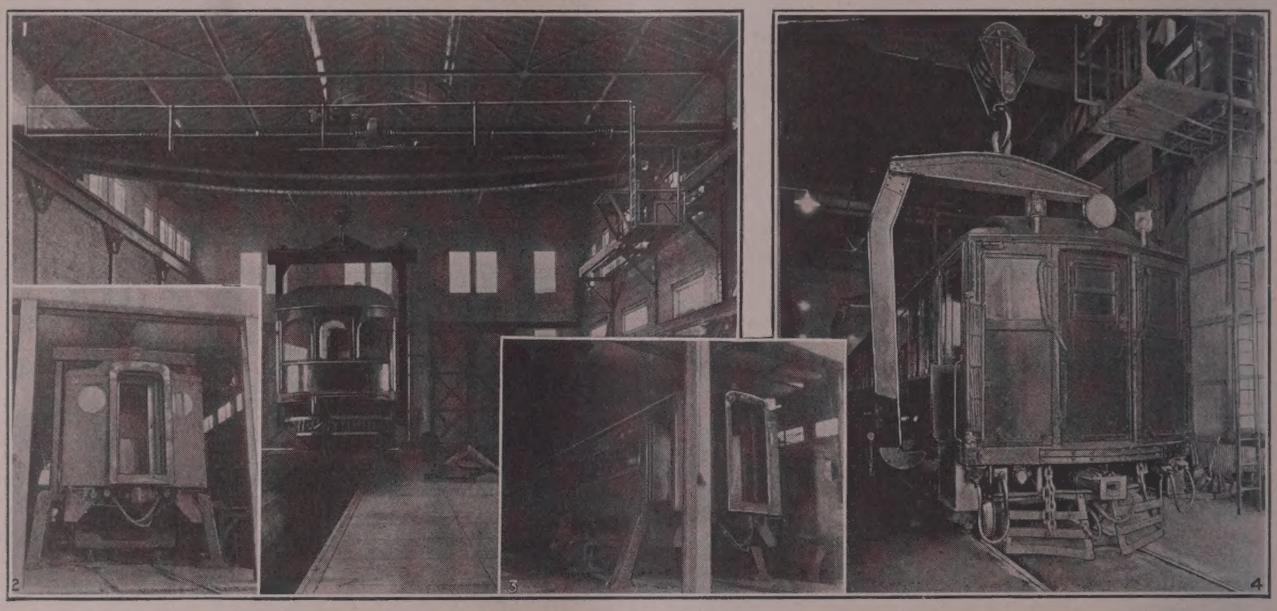
leads; (3) lifting car body from trucks; (4) placing trucks in position for overhauling; (5) inspection to determine repairs needed; (6) dismantling equipment and parts; (7) repairing various parts; (8) reassembling; (9) running trucks under car body; (10) lowering car body; (11) connecting brake rigging and motor leads, and (12) final measurements and adjustments.

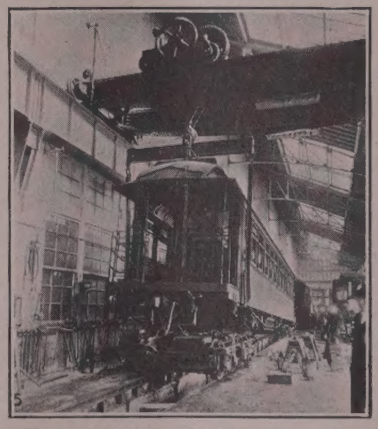
With different conditions and methods several items may be added to these. Thus where car body repairs, painting, etc., are done at the same time as the truck overhauling, and in another department, dummy or shop trucks are quite generally used. The car body is lowered onto these and moved to the carpenter shop or paint shop and is again returned to the overhauling shop when in condition to be mounted on its proper trucks. Some roads clean the trucks by some method or other before any work of dismantling is undertaken. Changes or additions to the equipment can be done to advantage while the car is in the shop for overhauling and the nature of the work may make additional operations necessary.

As soon as the car is placed in the overhauling shop various measurements should be taken to determine adjustments that will be necessary before the car is again returned to service. There seems to be no uniform practice among electric railways in regard to the person designated to do this work. It is frequently done by the shop foreman, assistant foreman, foreman of overhaulers or particular men designated to look after this detail. Cars in city service require measurements of step height, wheel guard height and side bearing height or measurements at the corners of the car body to detect weak springs or defective parts that need attention. Cars in interurban or rapid transit service require measurements of platform and coupler height. A common method is to mark these dimensions with chalk in some definite order on the truck bolster, side bearing or truck side frame. A definite location is desirable as this saves time in looking for them when they are needed. Some of the larger roads have a standard form on which to record measurements and a schedule man to follow this and other important alterations.

The disconnecting of brake rigging and motor leads is usually done by the truck overhauling crew. It is most convenient to have the car over a pit while this work is being done and most overhauling shops have pits provided. The equipment committee of the American Electric Railway Engineering Association devoted considerable time to a study of pit requirements for overhauling shops during 1920, 1921 and 1922 and its recommendations are included in the report on design of typical shop buildings presented by the building and structures committee in 1922. For shops where car bodies remain in a raised position while the trucks are being overhauled, it was considered advisable to provide individual pit space for each car overhauled, with floor space adjacent for the truck work.

One of the greatest problems of the medium-sized shop is the handling of car bodies for the removal of trucks. Information has been collected on methods and equipment used in over fifty electric railway shops. The equipment used can be grouped into six general classes. Jacks of either a mechanical, hydraulic, air or screw type were used for this work in 40 per cent of the shops visited; electric traveling cranes were used in 34 per cent of the shops; car hoists in 14 per cent, and the remaining 12 per cent





Various Methods Used for Removing Trucks from Under Car Bodies

No. 1. Raising a Connecticut Company interurban car for truck removal. A 15-ton crane spans three tracks.

No. 2. Raising a New York, Westchester & Boston car body to remove trucks.

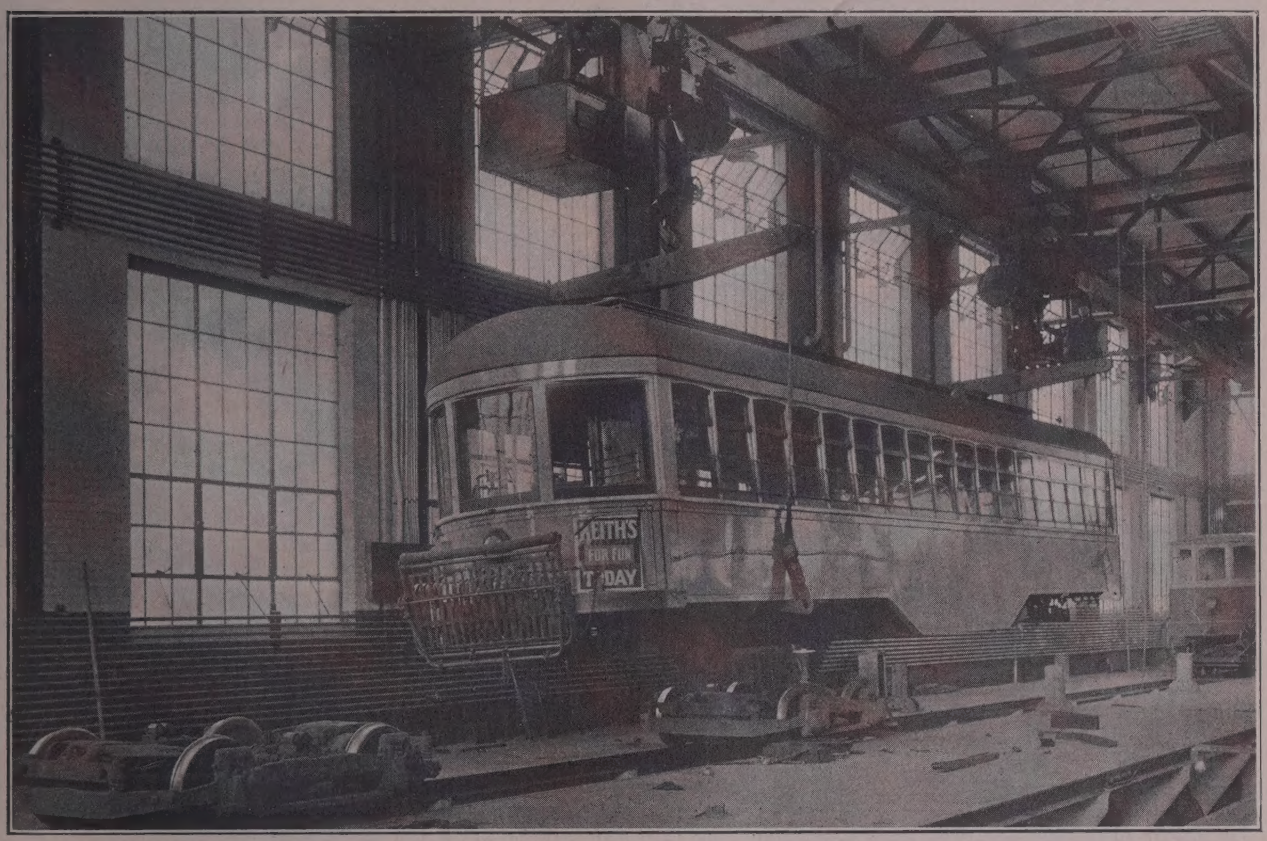
No. 3. By use of turntables in the floor, trucks are removed at the side of the cars in the shops of the New York, Westchester & Boston Railway.

No. 4. Crane room of the Long Island Railroad where car bodies are lifted from trucks.

No. 5. Lifting one end of a car for truck removal in the Wilson Avenue shop of the Northwestern Elevated Railroad, Chicago.

was divided among hoists operating on an I-beam or monorail; suspended hoists of a chain, hydraulic or air type and drop platforms or elevators. In this connection it is interesting to note that of three new shop designs completed this year, Boston uses a traveling crane and both Toronto and St. Louis use car hoists.

In deciding on the best type of equipment for any particular shop some of the points that should be given consideration are: Initial investment, time required for operation, adaptability to other service in the shop, convenience of operation, accident hazard and weight of cars to be handled. For handling heavy cars and equipment such as is used in interurban or rapid transit service, overhead traveling cranes or hoists mounted on I-beams or monorails are favored by most shopmen. This class of equipment has another advantage in that it can be used for handling heavy parts and dismantling or assembling of the equipment in the truck shop and thus be kept in almost continuous service. The initial cost of traveling cranes, however, is more than for the other types. Where ground conditions permit the bringing of cars in over the overhauling shop, drop jacks or elevators afford a convenient means for removing trucks.



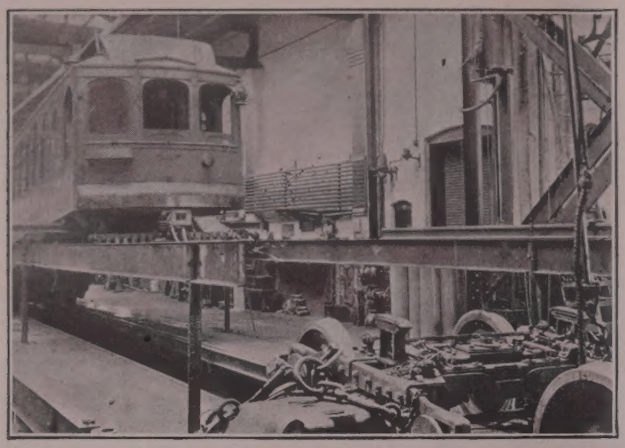
Lifting a Car Body by Means of Two Monorail Hoists in the Harv ard Shops of the Cleveland Railway

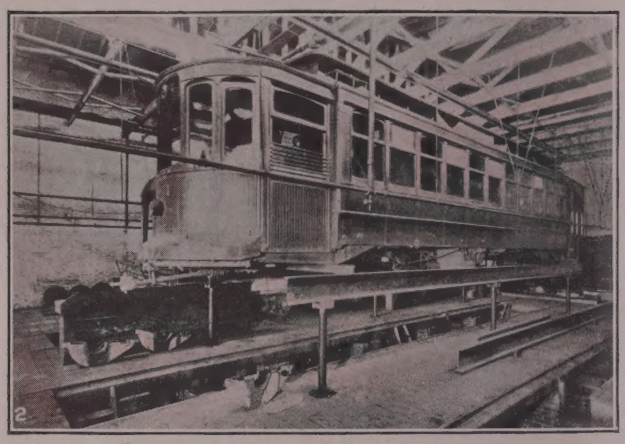
Special Rigging Assists in Lifting Car Bodies

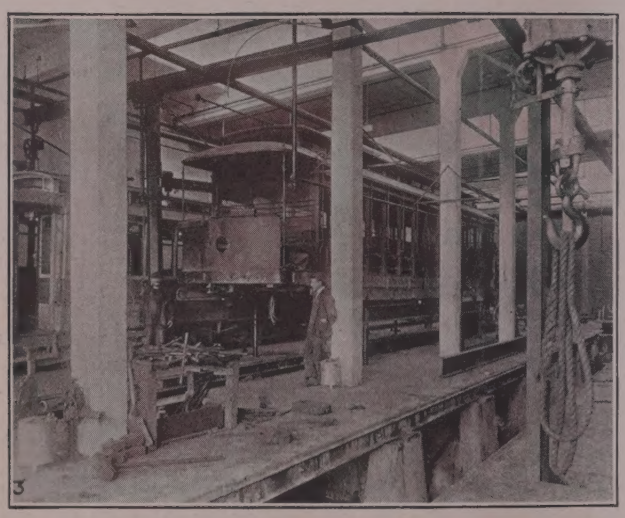
The accompanying illustrations show how cars are handled by the different methods. With overhead traveling cranes a special rigging is quite commonly used. This consists of a yoke extending over the top of the car body with two arms reaching to the bottom of the car. The arms have projections at the bottom to catch underneath the car body. An interesting feature of the Wilson Avenue shop of the Northwestern Elevated Railroad, Chicago, is the method used to store this rigging when not in use. The truck shop is located on the second floor on a level with the elevated structure and holes have been cut in the floor so that the two arms of the rigging can be let down through these. The only floor space occupied by this arrangement is that taken by the boom.

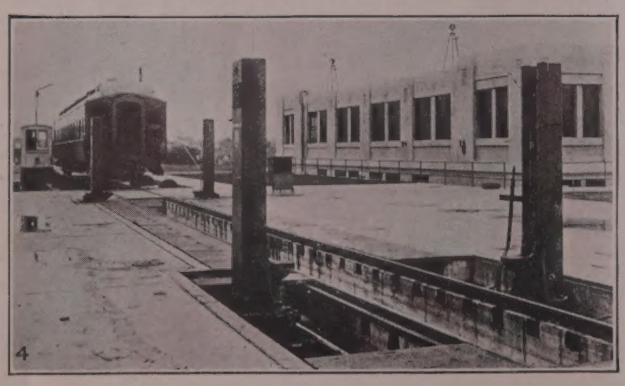
In most shops but one traveling crane is used and the car body is lifted one end at a time and is then let down on horses, which with the cross-supports bring the bottom of the car about 4 ft. 6 in. above the floor. A 6-in. I-beam is a convenient support where cross-beams are necessary. Instead of using the rigging just referred to the cross-beam is sometimes fitted with stirrups so that chains from the crane can be hooked in for lifting. In order to reduce the strain on the car body some shops raise the car body by three operations. One end is raised about one-half the height desired and let down on horses; the other end is then raised the full height and then a second lifting of the first end brings this to the desired height.

The New York, Westchester & Boston Railway uses an overhead crane and removes the trucks from the side of the car. A yoke rigging is attached to the crane for lifting and the car body is lowered onto heavy fabricated hinged supports which drop into position under the car sills. The track used for raising cars and also the one adjoining has hand-operated turntables of a diameter large enough to take a single truck. Before lifting the body, the car is located with the truck to be removed on this turntable. After lifting, the turntable is rotated through 90 deg. and a chain from the crane









draws the truck from under the car to the adjoining track, where the truck is again swung around and drawn by the crane to a convenient point for overhauling. Trucks are replaced by reversing the operation.

The Long Island Railroad has a crane room constructed at one end of its overhauling shops. Two overhead traveling cranes are used for lifting car bodies from trucks so both ends are lifted at the same time. The trucks are moved to the overhauling tracks by an electric tractor, the two trucks of a car being hitched together. The car body is lowered onto shop trucks and then is shifted by the tractor to the body and equipment overhauling section.

Two of the shops of the Brooklyn Rapid Transit System where elevated equipment is overhauled have drop jacks. With these the trucks are lowered from underneath the car body directly into the truck-overhauling shop. Heavy hinged supports hold the car body while the truck is being removed and a shop truck placed underneath. There is sufficient space at each end of the drop jack so that either truck may be placed over this. Traveling overhead cranes serve the truck-overhauling shops.

A drop jack or elevator is used in the Throop Street shop of the Metropolitan West Side Elevated Railroad, Chicago. This elevator is of a hydraulic type and is the most powerful elevator in the city of Chicago, if not in the Middle West. It has a capacity of 100,000 lb. and is operated at a speed of about 12 ft. per minute. To remove a truck the car is run over the elevator until the truck rests on it. Hinged supports are placed underneath the car body and the elevator is lowered with the truck upon it to the overhauling shop. This shop has a raised pit track and the truck is operated by its own power from the elevator to the pit track. The shop has a mezzanine floor where shop trucks are stored. After the truck to be overhauled is removed the elevator is raised to the mezzanine floor and a shop truck is received and placed under the car body. The car is then moved so that the other truck can be similarly replaced. Shop trucks are placed underneath cars only where it is necessary to keep them in the shop over a considerable period. For the mere changing of a pair of wheels or a motor the car is held over the jack until the change is completed on the lower floor.

Car Hoists Are Favored by a Large Number of Users

The type of car hoist quite generally used by electric railways consists of two I-beams or T-rails parallel to the track. The beams are raised to lift the bodies by means of screw supports. These screws are operated simultaneously by shafts and gearing installed beneath the floor level. An electric motor is generally used to operate the hoist, but in some cases these are operated by hand. A shop arrangement quite generally favored where car hoists are used is to provide pits the length of one car and have a car hoist for each pit. Accompanying illustrations show several shops with car hoists and give a good idea of the manner in which equipment is handled. In lifting car bodies short lengths of rail or

The Car Hoist Is Popular for Use in Truck Removal

No. 1. Lifting one end of a car by use of a car hoist in the Syracuse shops of the New York State Railways.

No. 2. Car body resting on car hoist while trucks are being overhauled in the shops of the Spokane United Railways, Spokane, Wash.

No. 3. Car hoist as used in one of the shops of the Connecticut Company.

No. 4. Car hoist particularly adaptable to lifting car bodies of interurban cars.

I-beams are usually placed across the side supports. For general overhauling the car body is ordinarily left in the raised position while the trucks are being overhauled, although the body can, of course, be lowered onto shop trucks and moved to another part of the shop.

On the smaller roads the use of jacks of various types is quite general. This method has the advantage of low first cost and can be used in shops without the necessity for special construction. Most shops already constructed would need strengthening to use some type of overhead lifting device, and in most cases there is insufficient head room for cranes. The method employing jacks requires more time, is tedious for the workmen and has a greater accident hazard than other methods.

Some shops have strengthened the overhead structure sufficiently to install hoists of either a chain, air or hydraulic type. Four of these are needed to lift a car unless some type of monorail construction is used. In general, the present design of shops determines the methods that can be used for lifting cars. For new shop construction, however, most master mechanics favor either traveling cranes or car hoists.

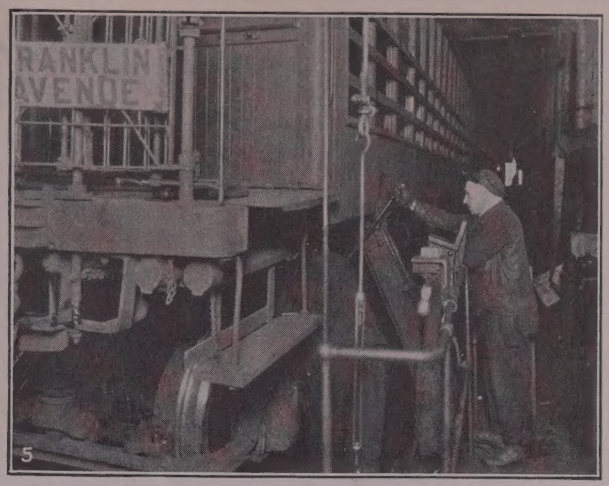
REMOVING TRUCKS FROM UNDER CAR BODIES

In most electric railway shops the work of truck overhauling is done on the rear of the same tracks over which the car bodies are jacked up. All that is necessary then to place trucks in position for overhauling is to run them out from under the car bodies. With light trucks these can be pushed out by hand without much effort, four to six men being used for this operation. In order to reduce the labor required for this and to overcome the necessity of taking men from other work to help push out the trucks several methods are in use.

For trucks equipped with motors a common method is to use the motors on the truck to propel it. For controlling the current to the motors a number of different arrangements are used. A controller mounted in a permanent position is a common method. A portable control outfit is used in the Harvard shops of the Cleveland Railway with good results. Other railways make use of the same controller used for operating a transfer table, a car hoist or the overhead electric crane. In addition to these methods trucks are hauled out by traveling cranes or tractors.

In regard to carrying on the work on the trucks themselves, most railways favor raising the truck off the floor so that the overhaulers can do most of their work in an upright position. A common method is to place the truck on low horses, but several shops have specially constructed cradles or truck stands. One of these is described on page 853 of this issue.

The tracks in the truck overhauling shop of the Third Avenue Railway, New York City, are raised about 15 in. above the floor by placing them on wooden supports. For new shop construction a better type which accomplishes the same result is to have the floor depressed around the overhauling truck. The rails can continue then on the same level throughout the shop. Some rail-



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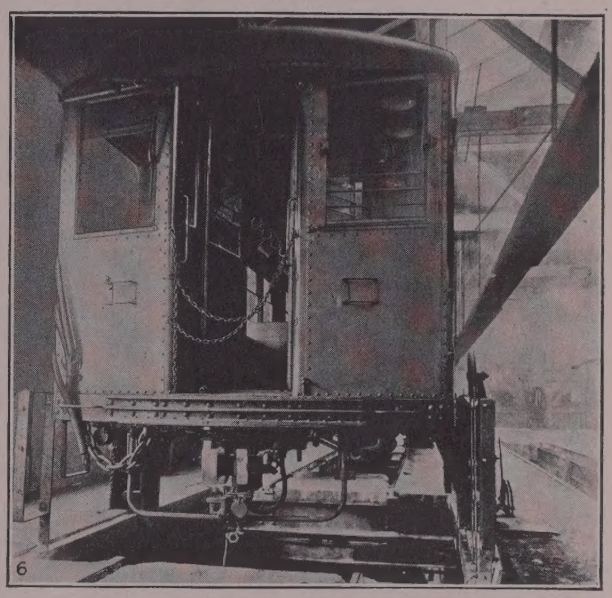
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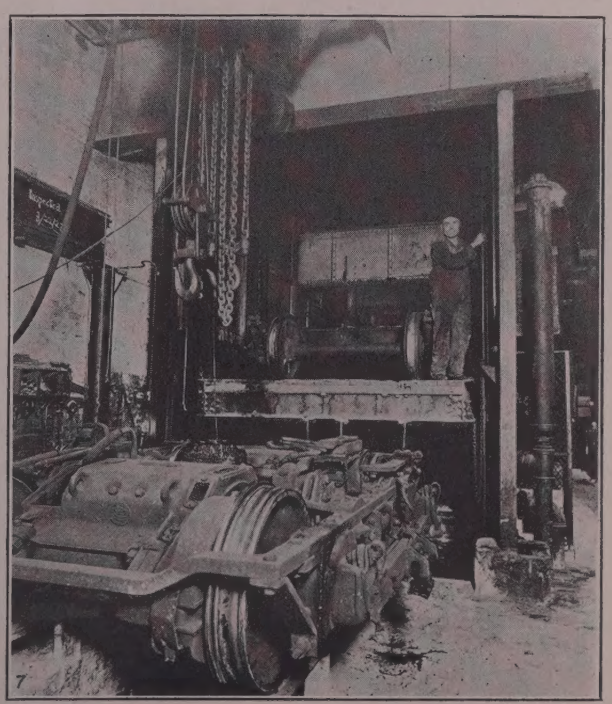
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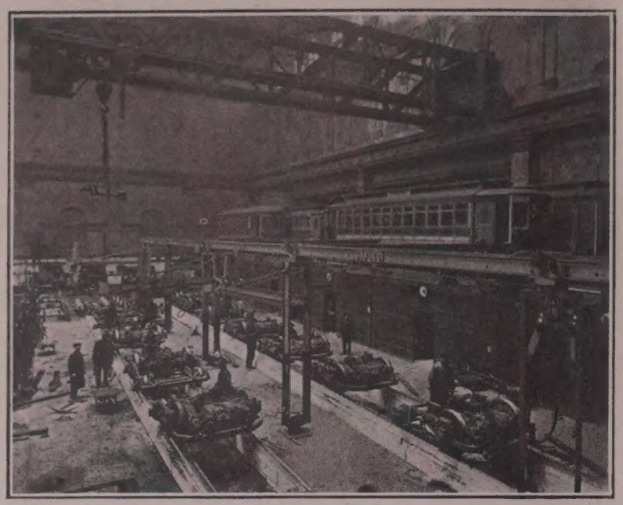
The Jack and the Elevator in Truck-Overhaul Work

No. 5. Lowering a truck into the overhauling shop by means of a drop jack in the Thirty-sixth Street shop of the Brooklyn Rapid Transit Company.

No. 6. Metropolitan West Side Elevated car over elevator in Throop Street shops, Chicago, ready to receive shop trucks after removal of operating trucks for overhauling.

No. 7. This powerful hydraulic elevator in the shops of the Metropolitan Elevated, Chicago, has a capacity of 100,000 lb. and is operated at a speed of 12 ft. per minute.



The Truck-Overhauling Tracks of the Third Avenue Railway, New York, Are Raised to a Convenient Height for Efficient Truck Overhauling

ways overhaul trucks over pits, and an accompanying illustration shows the overhauling shop of the New York State Railways in Rochester, where part of the pits are covered over. The work on the top portion of the trucks is then done on the floor level and the trucks are moved over the pits for the underside work.

In lifting trucks onto or off overhauling stands the most satisfactory method appears to be to attach the lifting rigging to the wheels. Strains to the truck frame are thus avoided. Also, where journal boxes are packed, the danger of pressing the waste away from the axles is avoided. A convenient type of lifting tackle will be described in a later issue.

The time required for placing the trucks in position for overhauling after the car is placed in the overhauling shop was found to vary from four or five minutes to thirty minutes per car. With reference to the length of time consumed the various methods appear to follow in this order: Raising by jacks takes the longest, then separate overhead hoists, car hoists, drop jacks, monorail hoists and traveling cranes. The traveling crane method apparently takes the least time. The length of time consumed, however, varies to a considerable extent with the number of cars that are handled in a shop at one time, the weight and type of the car, etc.

In one shop where the trucks for an average of three cars per day are overhauled the following method is used: The three cars are placed on two tracks which are served by an overhead traveling crane. The foreman of overhaulers checks dimensions, while two men disconnect brake rigging and two other men disconnect the motor connections. Two men with a man in the crane then lift the car bodies one after another. The trucks are then run out under their own power and are lifted into overhauling position on stands by the crane. The entire work for the three cars is done in a little less than one-half hour, or an average of about ten minutes to a car.

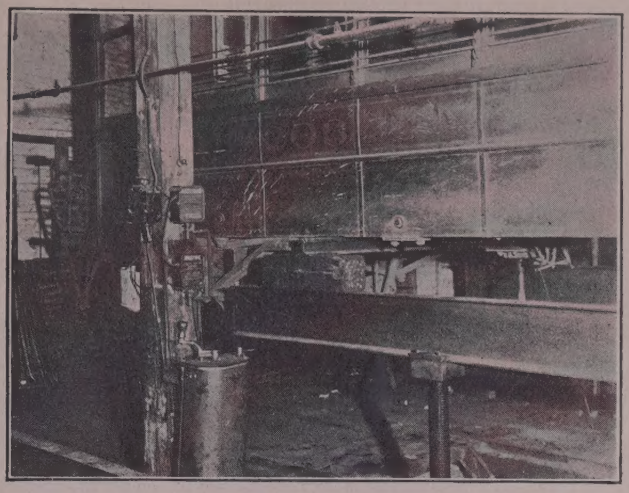
An idea of the speed obtained through use of a drop jack can be obtained from the fact that in the Throop Street shop of the Metropolitan Elevated, Chicago, the time taken to change a pair of wheels from the moment the car enters until it leaves the shop is but thirty minutes. The work done during this period includes the disconnecting of the brake rigging and motor leads, the lowering of the truck into the overhauling shop and the changing of wheels and replacing of the truck under the car with proper connections so that it can be returned to service.

THE WORK OF OVERHAULING TRUCKS

The work of overhauling will vary considerably even in the same shop. One thing that is most essential for efficient work, however, is a carefully worked out system so that each man will know what parts he is expected to look after and is held responsible for. By assigning men to do a special type of work, they become expert in that line and so can do better work. They also give more attention to making good repairs if they know that they are the ones held responsible for improper workmanship which may cause detentions or accidents

Air Hoists Are Used to Lift Car Bodies in the Federal Street Shops of the New York State Railways, Rochester, N. Y.

Removing Truck from Underneath Car Body with the Aid of a Portable Control Outfit in the Cleveland Railway Shops



Trucks Are Moved from Underneath Car Bodies by Their Own Power by Using the Car Hoist Controller in the Shop of the Spokane United Railway

in service. The repair of tools necessary for this particular work should also be assigned to the men using them. As an example of a method in force in one shop one man was assigned to remove all pinions and was held responsible for proper condition of his tools. Previous to the inauguration of this system wrenches for removing pinions were in the blacksmith shop most of the time. With the new system they are now always kept in good repair.

The following division of duties is used at one overhauling shop with good results. This shop averages four trucks and eight motors per day. Motor overhauling is done in a section alongside the truck overhauling. Two overhaulers and two helpers are used for overhauling the motors. One overhauler and a helper take off pinions and reinstall them, take the waste out of the bearings and fit new bearings into the housings. One overhauler cleans commutators, inspects brushholders, repairs motor wiring, installs wiring cleats, thimbles, etc., where necessary and jumps in on any wiring of fields with the other men.

The overhauling of the four trucks per day is done by four overhaulers and four helpers. These men strip the trucks and repair and replace brake rigging, bolsters, pedestals, angle frames, etc., as found necessary. One of these overhaulers is made responsible for the proper suspending of the motors when they are reinstalled.

An outline of the work done in overhauling a truck reads much like a list of truck parts, for all parts require attention. From among the instructions governing this work as issued by various companies the following points have been taken to illustrate important practices which ought to be followed more generally:

Trucks should be examined closely for loose bolts, nuts and rivets. Those in bad condition should be replaced and all tightened securely.

Special attention should be given to brake rigging. Cotter keys must be properly spread and brake release springs adjusted. New brake shoes and turnbuckles should be applied if these are badly worn. Prompt release of brake shoes is important and points where brake rods rub on the trucks and guides should be greased.

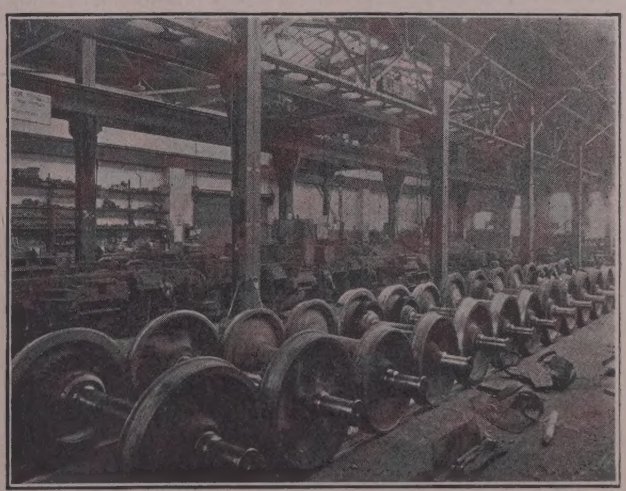
Truck side and center bearings should be rigidly attached to the bolster and this should be set by a standard gage.

Wheels should be checked for diameter and flange wear and those with sharp or thin flanges should be either turned down or replaced.

The diameter of wheels on the same axle should be the same to prevent crowding of the rails, with a consequent destruction of flanges and an increase in train resistance.

The diameter of pairs of wheels on the same car should not vary by more than $\frac{1}{4}$ in. Otherwise there is inequality of load on the motors.

A 5-Ton Crane Operated from the Floor Serves the Truck-Overhauling Shop of the Detroit United Railway



The Truck-Overhauling Tracks of the Long Island Railroad Are Served by an Overhead Traveling Crane

Gears and pinions should be checked and renewed if they will not last until the next overhauling.

Journal boxes, covers, bearings, plates, etc., should be inspected and removed if badly worn or broken. Journal bearings should be inspected and thin ones should be replaced.

Axles should be tested in a lathe to detect any that are bent. Any not true, badly worn, or which have made their predetermined maximum mileage, should be replaced.

Axle collars should be checked and tightened.

In collecting information on truck overhauling an attempt was made to determine the number of men required for this class of work. For shops overhauling from four to twenty cars per week an average of about one overhauler and one helper are used per car per week.

The wages paid this class of labor were found to vary through quite a wide range. For helpers from 40 cents to 60 cents per hour is paid and overhaulers receive from 60 cents to 75 cents per hour.

Many railway officials feel that motors should be sent to another department for overhauling. Better work will no doubt result from doing this in a cleaner, lighter place than the truck-overhauling shop. Most roads, however, do such work as taking off pinions, removing waste from the armature and axle bearings, fitting new bearings into the housings, cleaning commutators and brush-holders, repairing motor wiring and cleats, changing fields and painting the inside of motor shells on the floor adjacent to the truck-overhauling work. Where armatures or fields require repairs, however, these are removed and sent to the electrical department or armature room for the necessary work.

After the truck overhauling is completed, of course, the returning of the truck to the car body is taken care of by the same equipment as that used for removing it. In talking with the various men responsible for truck overhauling, all were agreed that if they were building new shops many of the methods and some of the equipment used could be replaced with more efficient methods and equipment. The use of overhead traveling cranes was favored by the majority for new shop construction, and one large railway that is now working on a design for new shops has included a very complete truck cleaning department. The method contemplates the use of large vats to be filled with lye. The trucks are cleaned by placing them in these vats in a manner similar to that used by the New York, New Haven & Hartford Railroad and the Kansas City Railways. These methods were described in the ELECTRIC RAILWAY JOURNAL for March 21, 1914, and March 19, 1921. In this new shop design it is also contemplated that provision will be made for air and gas piping so that rivets can be removed and various parts cut by an acetylene torch. Receptacles for attaching leads for electric welding are also to be included, and finally provision is to be made for repainting the trucks by a spray-painting system after overhauling and before they are reinstalled underneath car bodies. It is evident that many improvements of this character could be introduced in new shops with proper consideration to design, and no doubt some of them could be added to existing shops to advantage.

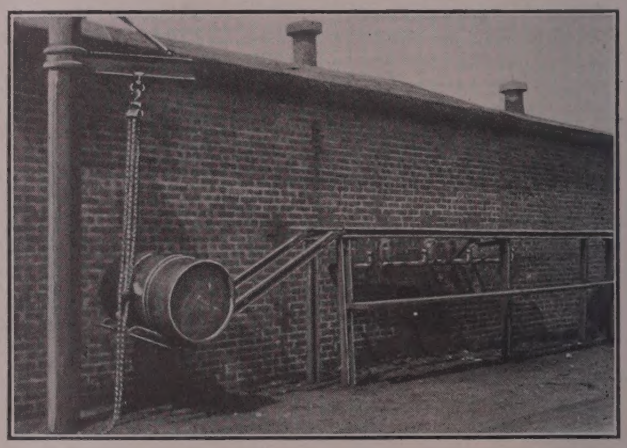
Toronto Report Shows Surplus

THE editorial comment in the last issue of this paper on the Toronto railway report erroneously referred to the return on the investment as "infinitesimal," because the "net income carried to surplus account" was only $109,468 on a basis of fixed assets of more than $34,000,000. This sum of $109,468, however, was the surplus after fixed charges, depreciation, organization expenses and various reserves had been deducted, and after $425,108 had been charged against redemption of debt (or repayment of capital). For the period covered by the report the system had an operating ratio (including taxes, but excluding depreciation) of slightly less than 68 per cent. Attention is called promptly to this error in order that readers will not be misled.

A Convenient Oil-Handling Arrangement

A SPEEDY and convenient method of emptying oil barrels has been installed at the East Twelfth Street shops of the Buffalo & Lake Erie Traction Company. The various oils used by the railway are kept in large tanks in an oil house separate from the main shop buildings. From the upper part of each tank an intake pipe runs out horizontally through the back wall of the oil house, bends upward at right angles and terminates in a screw cap. The oil is poured from the barrel through a funnel into the opening of this pipe.

On account of the height of the intake it was formerly somewhat of a problem to get the barrel into a position



Barrel Being Raised to Level of Runway

where its contents could be emptied into the funnel. To remedy this difficulty a special rack and hoist have been devised, as shown in the accompanying illustration. The rack is composed of two parallel light-weight rails about 18 in. apart, running horizontally along the back wall of the oil house and supported by several other rails of the same type set vertically in the ground. The axis of the barrel to be emptied is at right angles to the horizontal rails, and the barrel is then at such a height that there is just convenient space to introduce a funnel between the bung hole and the opening of the oil intake pipe.

An inclined approach to the rack is made by two short rail sections which are hinged to the longitudinal members at one end and rest on the ground at the other end. The ends which rest on the ground are connected by a strong tie rod under which passes the hook of a chain hoist.

A full oil barrel is placed on the lower part of the inclined section, and when the hoist is operated the rails are raised until they are on a level with the main part of the rack. The barrel can then be rolled along quite easily until it is located above the proper intake opening.

Armature Practice on Chicago "L"

Outstanding Features of the Armature Maintenance Practice of the Chicago Elevated Lines Are Thorough Mica Insulation of the Coils, Heating to Remove Shrinkage and No Patchwork in Repairs

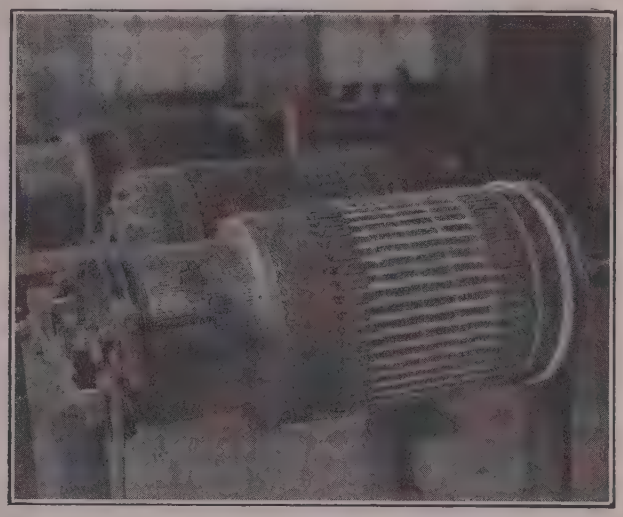
THE secret of proper maintenance of railway armatures lies in the correct selection of materials used in the rebuilding and the careful insulation of bars in the reconstruction. In the armature room of the Metropolitan West Side Elevated Railway shops, Chicago, the process of reconstruction has been gone into to such an extent that a very low record of armature failures has been established. The policy of "no patchwork" has been rigidly adhered to, and has resulted in a material saving of time and labor. Two especially interesting features upon which the engineers of the Elevated lay great stress are complete mica insulation of coils and reinforcement of corner insulation.

After the coils have been cleaned by the boiling process described in the ELECTRIC RAILWAY JOURNAL of March 3, 1923, page 377, they are then ready for the taping machine. Mica of 0.010 in. thickness is cut by the use of steel templets to fit the shape of the rear and front ends of the coils. Six can be cut at once, and one man working four hours can cut enough of the mica strips to supply ten armatures. These strips are sorted and then placed in a box for future use. The proper shaped mica is laid between bars of the coil and on the outside, and each is taped separately, as far as the bend.

As the coil must be compact enough to allow it to be placed in the slot of the armature and still provide mica insulation throughout, it is necessary to tape with the one-half lap process only every other bar, through the straight portion. Thus, in a three-bar coil the inside bar is left bare from bend to bend on the straight portions, while in a five-bar coil the second and fourth bars are bare. A coat of plastic insulating paint is applied to the bars and they are temporarily clamped together and placed in an oven of 300 deg. F. for one hour. Upon removal, they are pressed together in order to make a solid mass, and clamps are applied to hold the pressure. A layer of one-half-lap oiled linen tape is applied on the straight parts from bend to bend. The coil is again placed in the oven for an hour, after which a layer of one-half-lap cotton tape is applied. Painting with plastic insulating paint and a final period of one hour in the oven completely prepare the coil for use.

As can readily be seen from the foregoing, an important item in the process is the heating to remove all shrinking and dampness. To insure the absence of these factors, a final heating is given the coils just before they are placed in the core. A plan which has proved very satisfactory has been to place ten coils in the oven at once, and as one is removed to be placed in a core, it is replaced by another, thus keeping ten coils in the oven at a time.

Wood Insulators and Mica Core Insulation



Completed Armature Ready for Banding Machine

With the coils prepared in this thorough manner the next step is properly to prepare the core. Often the core has been injured in such a manner that it becomes necessary to press the laminations into shape. This should be carefully done in order to insure a first-class job. The core should also be filed to remove sharp corners and the commutator must be filed and tested for shorts. Insulation consisting of a layer of molding mica 0.025 in. thick, followed by one-half-lap cotton tape and a coat of insulating paint, is then placed on the front and rear coil supports. Insulation in the form of plate mica 0.025 in. thick is next placed in the slots. To reinforce the corners, which are the vital spots in armature construction, as practically all failures occur at this point, a special method has been followed. A piece of molding mica 2 in. x 4 in. of 0.10 in. thickness is heated and formed to the shape of the slot with a die. A piece of flexible molding mica 4½ in. x 15½ in. of 0.025 in. thickness after being formed is shellacked in

the slots, as will be seen from the accompanying photograph. The 2-in. x 4-in. corner pieces are then placed inside the longitudinal mica troughs in such a manner as to produce a double thickness of mica insulation at the corner. The core is now completely insulated and is ready for the coils.

As previously stated, the coils are heated before being placed in the core. This fact cannot be too strongly emphasized, as the heating process is one of the most important in the reconstruction work. The coils for the first or lower layer are now placed in the slots and connections made to the commutator. In the case of the GE-55 motor, the front ends of the coils are separated from each other by wood strips $\frac{3}{16}$ in. thick and the height of the coil. These strips are curved to fit the contour of the core and are only used on the lower layer of the coil. The rear ends of the coils have previously been fitted with clips, and hard mica is placed between bars at a point where the bend comes just before the bar enters the clip. The same use of sheet mica is followed at the commutator ends of the coils. This is done to insure proper insulation at these critical points.

Steel clamps or straps are then placed about the armature at the coil ends and drawn up in order to form a compact mass of the lower level of coils. These clamps are removed after all coils are firmly drawn into position. A test for shorts with 110 volts d.c. is made of the commutator and the coils which are now in place.

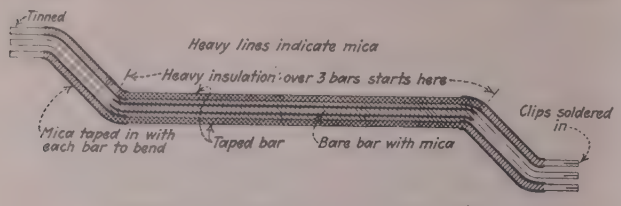

Tinned
Heavy lines indicate mica
Heavy insulation over 3 bars starts here
Clips soldered in
Mica taped in with each bar to bend
Taped bar
Bare bar with mica

Diagram of Three-Bar Coil Construction

By the plan described, the coils up to this point have been thoroughly insulated from the core and from each other by at least one thickness of mica and in the bends and corners by at least two thicknesses. The insulation between the lower and upper coils at what are known as the coil ends is provided by means of two layers of 0.010 in. molding mica, one layer of 10 oz. duct and two coats of shellac. A $\frac{1}{2}$-in. strip of 0.035-in. mica $15\frac{1}{2}$ in. long is used in the slot. A break-down test of 3,000 volts a.c. for one minute is now given to the lower coils.

The upper coils are placed in the same manner as the lower coils, with the exception of the $\frac{3}{16}$-in. wood strip, which is omitted due to the lack of space. Plate mica is placed between the bars of the coils and asbestos between the rear clips, and the upper coils are soldered to the clips at the rear. However, the front or commutator end is soldered and a copper separator is placed between the leads. After the top lead is driven down, it is wedged in place with a copper slug, which is filed and soldered.

Heating of the armature to take up shrinkage is now accomplished by use of a low voltage and high amperage current which is passed through a completed coil, which consists of both the upper and lower parts. A temporary holder with carbon brushes has been erected on one of the supports to facilitate applying current to the coils for this heating process. The coils are then driven down to the slot with a $\frac{1}{2}$-in. fiber drift, the mica is trimmed off, clamps are applied front and back, and the armature is placed in the oven for twelve hours at a temperature of 260 deg. F. During this period of baking the clamps are drawn down occasionally as the shrinkage is taken up in the coils.

After being removed from the oven the armature is banded on the banding lathe with mica, asbestos and leatheroid, with one layer of cotton on top, forming the insulation under the bands. One coat of amber varnish is then applied to the armature by means of a brush. From continued experiments it has been found that the most desirable and efficient way to apply the varnish is by careful use of a brush. Then the armature is again placed in the oven at 260 deg. F. and allowed to remain until the next morning. One coat of amber varnish is then applied every one and one-half hours until eight coats have been applied. The armature is then taken out of the oven and cooled.

To provide additional insulation to the commutator ends and to insure the armature against flash-over, three layers of boiled linen tape cut 0.010 in. in thickness on the bias with three coats of amber varnish are wound over the retention ring of the commutator. The armature is now ready for service.

In the opinion of the shops department of the company an armature prepared in this manner should operate without an electrical breakdown for at least ten years. On a property the size of the Metropolitan Elevated, which operates 283 motor cars with two motors per car, immunity from armature trouble is one of the greatest factors in securing low maintenance cost of equipment. Previous to this régime of the careful selection of materials and this new thorough method of insulation, it was not an unusual thing to have four armature winders with the customary helpers working overtime from four to five nights a week in order to keep enough armatures on hand to keep the road in operation. Naturally, following the installation of the new system it took time properly to rebuild and reconstruct all armatures. Now this work has practically been finished, and at present only two armature winders with the corresponding number of helpers are required to handle all the work in a comfortable fashion. Most of the work now being done is the rebuilding of armatures which have been damaged due to some mechanical defects in the shafts or spider. A group of nineteen extra armatures is kept on hand at all times immediately to replace any which may have to be removed from service. While the policy of "no patchwork" has been rigidly adhered to with profitable results, an upper coil will be replaced if damaged by some mechanical cause, such as the armature riding on the pole piece. Rigid adherence to this high-class reconstruction work has proved very profitable.

Loss of Head in Pipes

THE formula for loss of head in new, clean wrought iron pipe carrying water, given in the artiele on page 806 of the issue of this paper for May 12, 1923, should read as follows:

$$H = \frac{0.0319}{d^{1.16}} V^{1.9}$$

where H is the loss in head in feet per hundred feet of pipe, V is the velocity of flow in feet per second, and d is the pipe diameter in feet.

The Asphalt Wearing Surface Being Placed Upon Completed Asphalt Concrete Base

Asphaltic Concrete Base Makes Possible Rapid Paving Program

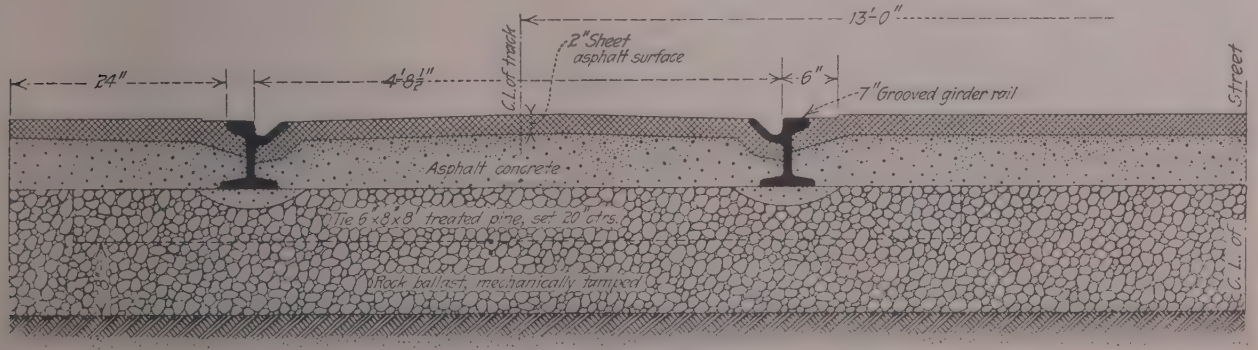
Pacific Electric Railway Abandons Hydraulic Concrete Base Because of Necessity of Keeping Track Under Traffic and Inability to Single-Track Service

By Clifford A. Elliott
Cost Engineer Pacific Electric Railway, Los Angeles, Calif.

THE Pacific Electric Railway, in operating a large mileage of local street car lines in some ten cities of southern California, has been confronted with various improvement ordinances requiring reconstructing and repairing of tracks. Such ordinances specify that the pavement in and about high-T and grooved-girder rail shall consist of 6 in. of hydraulic concrete base and 2 in. of sheet asphalt wearing surface. It has been found to be an impossibility to continue the use of this type of pavement due to street traffic, both automobile and street car, and to the inability to kill one track of a double-track line during the period of reconstruction and paving. A new type of paving was therefore necessary and the resultant type has come as an outgrowth of nine years of experimenting. It has met the approval of the municipalities where permission has been granted to substitute it for the former type.

The company is now using a type made up of an asphalt concrete base with sheet asphalt wearing surface. This type meets all requirements in that it can be successfully placed in and about the rails while the track is in service. This pavement gives a resiliency desired in the track structure, and the after results are most favorable for making repairs to the rail joints and track bonds because of the ease with which the paving material may be removed and replaced. In the old standard, when hydraulic concrete base was used, the depth of the base was 6 in., while the sheet asphalt surface was 2 in. in depth. In using this new type of base its depth is confined to 5 in. and the wearing surface depth to 2 in. The cross-section illustrating this type of pavement indicates how the asphalt concrete base is carried down beneath the base of the rail for a depth of 3 in. in order to provide additional reinforcement for the rail.

Many items enter in the selection of the proper base



Cross-section of Pacific Electric Track with Asphaltic Paving Base

Placing and Rolling, Under Service, the Asphalt Concrete Type of Base

when a paving program is proposed, among them being the amount of interruption to traffic over the section undergoing improvement. Such interruptions cause patrons to desert the street railway line and patronize the jitney bus. Another item to be considered is the public favor the utility will gain when the municipalities see that a first-class type of pavement is being laid in the least possible time. Municipalities as a rule have a tendency to complain of the lengthy time utilized by street railways in repairing, reconstructing and paving their tracks. In support of asphaltic concrete, along these lines, it may be said that twenty-four hours after a section has been laid vehicle traffic may pass over the newly paved area, while there need be no interruption in car traffic during any stage of the construction.

A large amount of the company's trackage in the city of Los Angeles is operated jointly with the Los Angeles Railway lines and is of combination-gage construction. The Pacific Electric Railway tracks are laid to standard gage, while the third rail is laid to narrow gage—3 ft. 6 in. In the paving of tracks of this nature, as well as in snug locations and on special work, a more economical and efficient job may be obtained by the use of asphaltic concrete base than by the use of hydraulic concrete base.

In the downtown business section of this city the

Placing Asphalt Concrete Type of Base Around Special Work

engineering department, in the recent reconstruction of some of its tracks, has found it advantageous for handling track reconstruction and repaving work, where this type of pavement was used, to obtain the city's permission to close up one side of the street at a time, but not for more than one city block. These jobs were handled with a twenty-four-hour force. A number of feet of track was completely reconstructed, the ballast being machine tamped. The engineering department's paving gang, working during the night period, placed the asphaltic concrete base, while on the following day the day paving forces placed the sheet asphalt wearing surface. It was possible to handle these jobs in congested business districts of the city only in this manner. The asphalt concrete base could not be successfully rolled, in accordance with the plans for placing the base, during the daytime, as street car headway in this particular district varied from thirty seconds to two minutes, depending upon the time of day.

With reference to the proved life of this type of pavement, it has been found that a strip of like nature was laid on Main street in Visalia, Calif., in 1894, which consisted of an asphalt concrete foundation approximately 6 in. in depth, with an asphalt wearing surface a good inch in thickness. The city has expended nothing on its maintenance and in June, 1920, it was considered to be in good condition.

The Pacific Electric Railway secures its supply of this type of pavement from asphalt contract plants. It is mixed at the plant under the railway company's specifications and is purchased in terms of boxes, the approximate weight of one box of the mixture amounting to 1,000 lb. The specifications for the asphalt concrete base and asphalt wearing surface are as follows:

BITUMINOUS BASE

(a) Composition.

Bituminous base shall be composed of asphalt cement, broken stone and sand in the following proportions by weight:

	Per Cent
Asphalt cement	4½ to 6
Stone and sand:	
Passing a 10-mesh screen	20 to 30
Passing a ¼-in. screen and retained on a 10-mesh screen	6 to 20
Passing a ½-in. screen and retained on a ¼-in. screen	10 to 20
Passing a 1-in. screen and retained on a ½-in. screen	20 to 40
Passing a 2-in. screen and retained on a 1-in. screen	5 to 25

(b) Mixing.

The different sizes of stone shall be kept in at least two separate bins and 10-mesh material in a third bin. The proportioning of the various sizes shall be done by means of multiple-beam scales.

The broken stone and sand shall be heated to a temperature between 225 and 275 deg. Fahr. and shall be placed in a mixer and the required asphalt cement added.

The asphalt cement shall be prepared for use by previously heating to a temperature of not more than 325 deg. Fahr. and when used the asphalt cement shall not be colder than 285 deg. Fahr. Each batch shall be mixed at least sixty seconds, with the paddles of the mixer running at a speed of not less than seventy-five nor more than ninety revolutions per minute. In addition at least ten seconds shall be allowed on each batch for charging and emptying the mixer.

ASPHALT WEARING SURFACE

(a) Composition.

Asphalt wearing surface shall consist of a mixture of asphalt cement, stone dust and sand in the following proportions by weight:

	Per Cent
Asphalt cement	10 to 12
Sand and stone dust:	
Passing a 200-mesh screen	13 to 17
Passing an 80-mesh screen and retained on a 200-mesh screen	20 to 25
Passing a 50-mesh screen and retained on an 80-mesh screen	17 to 22
Passing a 30-mesh screen and retained on a 50-mesh screen	18 to 24
Passing a 20-mesh screen and retained on a 30-mesh screen	4 to 8
Passing a 10-mesh screen and retained on a 20-mesh screen	2 to 5

At least 15 per cent and not more than 18 per cent of the wearing surface mixture shall be stone dust of the kind and quality hereinbefore specified. Of material passing 80-mesh screen and retained on 200-mesh screen not less than 30 per cent nor more than 50 per cent shall be retained on a 100-mesh screen.

To determine the estimated amount of asphalt required per square foot of area to be placed where double-

track right of way is figured 22 ft. wide and single-track right of way is figured 10 ft. wide, the following requirements are standard:

For asphalt concrete base with 7-in. high T-rail a finished area of about 1¼ sq.ft. to a cubic foot of material is produced, while with 6-in. T-rail, the finished area is about 1⅜ sq.ft. to the cubic foot of asphalt.

Where only surface asphalt paving is laid an area of approximately 6 or 6½ sq.ft. is covered to the cubic foot of asphalt.

Where the pavement consists entirely of asphalt, the area obtained from a cubic foot of asphalt depends entirely on the manner in which the track is dressed. In estimating the amount of asphalt material required, it is figured where 7-in. high T-rail is used there will be from 8½ in. to 9 in. of pavement; where 6-in. high T-rail is laid, 8 in. to 8½ in. of pavement.

If no paving blocks are used along the edge of the rails, the pavement is laid in two courses, each course being rolled with a 10-ton steam roller, which consequently gives manifoldly more compression in the pavement than ordinary street work.

Where paving blocks are used the bottom course is rolled before the blocks are set and the middle course is rolled with an 850-lb. hand roller, weighted down with about 200 lb. and the surface is rolled with a 6-ton roller, which adds considerably more compression than ordinary street pavement.

Overhead Line Notes from Detroit

Municipal Street Railway Department Is Making Many Investigations with a View to Reducing Maintenance Costs—One Feature Is a Plunger Type of Hanger —Records Show Good Results with Alloy Wire

THE Detroit Municipal Railway is conducting several interesting tests of overhead line material and construction. One of these is on what is called a "test line." It is a mile long (two miles of single track) and is equipped with a large number of different hangers, pull-offs and overhead material, as well as different methods of suspension. This line has been in operation since Aug. 1, 1921. It carries a fair amount of traffic, that is, cars with about a five-minute headway. The trolley wire is hard-drawn copper. In addition, the Municipal Railway has installed a section of catenary construction over a thirteen-track steam railroad crossing. This catenary has been in service about two years and is built with a phono-electric trolley wire with copper-clad steel messenger, copper-clad steel hangers and span wires, and with all of the miscellaneous fittings copper plated. The track crosses part of a steam-railroad freight yard in which there is continuous drilling of steam locomotives. The purpose of this installation, as far as the type of material was concerned, was to determine whether this form of construction would withstand the corrosive action of the exhaust gases from the steam locomotives.

In addition, the road has been conducting some comparative tests of phono-electric and hard-drawn copper trolley wire, both in the same service. Two comparative tests have been made, one on Charlevoix Avenue, the other on Myrtle Avenue. In the latter case, the overhead wire on one track is phono-electric and on the other hard-drawn copper.

The electrical department has also been tabulating all breaks of trolley wire, saving samples of the broken wire and listing the information with data as to when and where the wire was installed, the number of wheel movements under the wire at this point, etc. This is being done to produce, if possible, actual data on the limits of economical wear, and also to determine the causes contributing to wear. The railway has also been experimenting with a number of new types of overhead appliances.

Results of These Tests

As a result of the test of the catenary construction over the steam railroad, described above, it has been found that after two years there are absolutely no signs of corrosion of any of the parts, and the electrical engineering department believes that this problem has been solved. Not quite as conclusive results have been obtained from the other experiments, due to the fact that they have not been carried on long enough, but much of interest has been recorded.

Plunger Hanger in Place

The question of trolley wire breakage has proved a serious one on the Detroit system. From May 15, 1922, to April 1, 1923, there were approximately 1,600 trolley breaks on the overhead system, each, of course, meaning a delay in traffic. As explained, each of these breaks is listed and a record is made. Four reproductions of sample records are shown. Records from the test tracks indicate far greater service from the phono-electric wire than from the hard-drawn copper wire. Thus on the Charlevoix line the records from Aug. 1, 1921, to December, 1922, show a reduction in area of the phono-electric of 3.91 per cent and of the copper of 6.64 per cent. On the Myrtle Avenue line, a reduction in area was shown for the phono-electric wire of 3 per cent and for the copper of 9 per cent. This is equivalent on the Charlevoix line to a wear of the hard-drawn copper as compared with phono-electric which is 1.7 times as great and on the Myrtle Avenue line, three times as great. Of course, the life of the two wires would show an even greater difference because phono-electric No. 00 wire has a tensile strength of 80,000 lb. per square inch, whereas the hard-drawn copper, according to the

East Bound Baker between Vermont and 12th Sept. 25, 1922 0.310 ← 0.362 Report No. 1,008 Installed May 1918 Cause – broke at center of span Trolley movements, city cars 646,238	North Bound Curve Bates and Woodbridge Oct. 4, 1922 0.200 ← 0.294 Report No. 1,069 Installed Oct. 1918 Cause – broke at splicer Trolley movements, D.U.R. 555,078
Beaubien between Kirby and Ferry Sept. 13, 1922 0.239 ← 0.323 Report No. 941 Installed June 1916 Cause – broke at Clark splicer Trolley movements, city cars 1,071,252	South Bound Beaubien and Kirby Sept. 29, 1922 0.262 ← 0.322 Report No. 1,043 Installed June 1916 Cause – broke at ear Trolley movements, city cars 1,079,700

Reproduction from Trolley Break Records

The Motion Picture Shows the Trolley Wheel in Action
(The sequence follows from top to bottom.)

A.E.R.A. specifications for trolley wire, would be expected to have a tensile strength of between 51,600 lb. and 56,000 lb. per square inch.

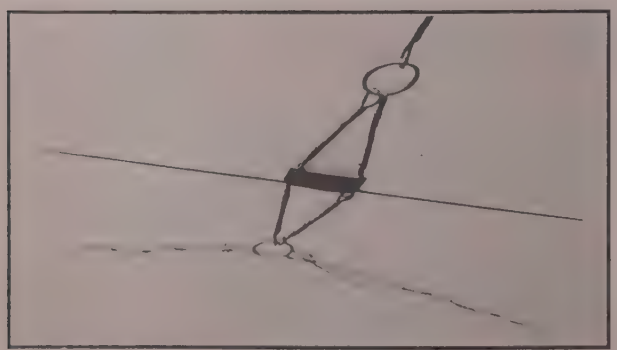
Changes in Line Equipment

While instructive so far as they go, these records of tests of trolley wire do not tell the whole story. The tests of the street railway department suggest other directions for improvement. One of these is in some more flexible means of suspension to reduce the wear of the wire under the ear, more perfect alignment at frogs, the strengthening of other overhead appliances and the protection of the overhead construction from blows from a trolley pole which becomes dewired at such critical points as strain plates.

To provide a more flexible suspension a trial is being made of a plunger hanger designed by the electrical department and manufactured by the Hackett Brass & Foundry Company, Detroit.

The first flexible hanger, installed in November, 1921, consisted of a straight plunger bolt working as a piston against a spiral spring in a brass cylinder packed with grease. It was found from experiment that this device did not give the anticipated resiliency because the trolley wire suspended from the hanger weighed about 40 lb. and the pressure of the trolley wheel against the wire was of the order of 27 lb. It will be seen that the difference was more than enough to prevent the wheel from lifting the wire.

The hangers was redesigned and a ball-and-socket joint put in the plunger, the idea being to provide a slight lateral movement, if experience proved this to be advantageous. This modified hanger was tried out for several months and the spring was removed and replaced in the hanger in such a way that the plunger was resting on the spring instead of working against the spring, thereby allowing the spring to aid the trolley wheel in lifting the trolley wire. This scheme has proved to be better than the hanger in which the plunger was working against the spring. Another hanger is being designed, having the same general characteristics as the latter as far as the spring suspension is concerned but with the ball-and-socket joint removed, as it was found that the lateral movement caused an abnormal wear on the side of the ear.



New Strain Plate and Method of Support

A view of one of these hangers in place is presented.

In an effort to determine exactly the movement of the wire under the action of the upward thrust of the trolley wheel, three series of moving pictures were taken of the passage of a trolley wheel under a hanger. These pictures are not particularly conclusive, but the electrical engineering department is not discouraged. Further efforts will be made to determine just what the effect is of the movement of an upward pressing wheel on a wire held in a partially rigid support, as well as in a flexible hanger.

Strengthening the Overhead Parts

To strengthen the overhead parts against blows from a dewired trolley, the Municipal Railway is now beginning the use of steel forgings instead of malleable iron for such parts as pull-overs, bull rings, anchor plates, etc., and is considering their use for frogs and crossings. Specifications have been prepared or are under preparation for a number of detail parts. These steel parts are galvanized to meet A.E.R.A. specification Df 2b. It is believed that steel will be more nearly immune to breakage from blows from a dewired trolley than the malleable iron now available in the market, as shown by tests of an adjustable pressed-steel spring frog which has been under test for more than a year.

In addition to the adoption of steel as a material, the design of some of the overhead parts is being changed. Thus the strain plate is being made 8 in. wide between the eyes instead of 5 in., and it is tied in to bull rings to reduce the danger of a "bootjack" pull, namely, the danger that the dewired trolley wheel and pole will catch in the acute angle usually existing between the end of the strain plate and the span wire.

A double-boss Cleveland splicer is used with the Metropolitan strain plate, instead of a solid ear. In this splicer, the wire is cut and the ends are brought through sleeves to the top of the splicer, where they are held in place by wedge collars.

A test is being made with an automatic strain plate, made by the Slaymaker Welding Company, of Detroit, in which there is a cam which permits the wire to move loosely in the strain plate in normal conditions. But if a break occurs the sudden release of tension on the trolley wire brings the cam into action and it holds the wire from slipping through the strain plate.

Another new device is the Slaymaker adjustable pressed-steel frog. In this the arms can be set at any angle. In fact, they can take their natural angle when the overhead construction is being erected. After the line is tightened up, the arms are bolted in place. One of these adjustable frogs has been in use for a year and ten more have been received and will be installed shortly.

Carrying Safety to the Public—II*

"Safety Week" Has Proved the Best Way to Start a Campaign —Organization of the Committee in Charge Must Be Done Right—Programs, Posters and Parades Are Essential Elements

By C. W. Price
Vice-President in Charge of Public Safety, Elliott Service Company, New York City

This Monument Was Dedicated by the Children to the Memory of Those Children Who Had Lost Their Lives in Accidents

THE first "Safety Week," in 1918, marked the beginning of the successful campaign in St. Louis. During that week there was one death, as compared with twenty-four the corresponding week of the previous year. Since then practically every city which has developed organized community safety has inaugurated its campaign with a safety week.

Experience has proved that more can be done to awaken widespread interest, and by a striking demonstation to convince the people that accidents can be prevented, than can be accomplished in a year of effort along ordinary lines. The one important thing at the start off is to make the public believe that the whole community can be aroused and interested and that people can be led to stop being careless and to begin being careful.

The program of activities for a safety week campaign has been so well worked out as a result of the past five years experience that, given the proper leadership and an efficient organization, practically the same results can be achieved in any community. This is evidenced by the experience of four cities which represent practically every condition found in any city in the United States—New York, the metropolis; Washington, the residence city; Pittsburgh, the great industrial center, and Baltimore, a typical city. In each of these cities a safety week campaign was conducted during 1922, with the results shown in the accompanying table.

*The second of a series of ten articles.

Not a child was killed or even seriously injured in Washington during safety week.

An incident in the Baltimore campaign illustrates in a striking way how an intensive drive will grip the interest of automobile drivers. On Friday of the week, called "Railroad Crossing Day," all of the grade crossings of the four railroads operating within the city limits were watched by checkers and a careful note was made of the conduct of the driver of each vehicle. During the day 60,301 vehicles passed over the crossings. Only 275 failed to observe the rules of safety, or 0.4 per cent. A similar check recently made on some fifty-three railroads in various parts of the United States showed that more than 50 per cent of the drivers were found violating the rules of safety.

It has been found that these features of a safety week drive, which are the most effective in gripping the interest of the people, apply equally well, with slight modifications, to the continuous year-round campaign which follows.

It generally has been found advisable to form a temporary organization called a safety week committee to

ACCIDENTAL DEATHS

	Safety Week, 1922	Corresponding Week, 1921	Per Cent Reduction
New York	24	70	65
Baltimore	2	9	77
Pittsburgh	9	22	60
Washington	2	6	66

The First Prize Exhibit, by the War Department, Consisted of These Four Floats Depicting "Perils of Peace"

conduct the week's campaign, and out of the good timber discovered then to form the permanent organization.

It is highly essential that a man be selected as chairman of the committee who has a talent for leading campaigns, a man who can command the enthusiastic co-operation of large numbers of people. The second essential is that one man, in the capacity of manager or secretary, should be employed to give his entire time to directing the campaign. Such a man, if thoroughly acquainted with the experience of other cities, will be able, at a minimum cost, to organize those activities which will secure results. Most of the items on a successful program do not cost money, but cost effort in securing volunteer co-operation.

The outline which follows includes fourteen activities, each one of which occupies a vital place in the program and plays a distinct part in reaching and interesting the public:

1. *Proclamation.*—A proclamation should be issued by the mayor, setting apart the week as "Safety Week" and urging the co-operation of the people.

2. *Monument.*—First in Baltimore and then in New York, Pittsburgh and Washington, a temporary monument, beautifully designed, was erected and dedicated to the memory of the children killed by accident during the previous year. On this monument were inscribed the number and ages of the children killed and a pledge by the people that such a sacrifice would in the future be made impossible. The dedicatory services consisted of addresses by the Mayor and other prominent citizens, and a program of music. In Washington ninety-seven little children dressed in white robes, representing the number of children killed the previous year, each deposited a flower at the base of the monument. The effect has been the same in each city. It has served graphically to bring to the attention of the public the seriousness of the accident situation and has proved a most effective event to start the safety week.

3. *Safety Sunday.*—In each church on the Sunday marking the beginning of safety week the minister should be urged to preach a sermon on safety, emphasizing the duty of every Christian to help conserve life. A safety lesson should also be taught in the Sunday schools.

4. *Schools.*—The following program should be carried out in all public, parochial and private schools:

(a) A safety lesson should be taught each day from a printed lesson furnished by the safety week committee, each lesson covering some one serious hazard to children.

(b) Each child should write a letter to his parents regarding safety week, and receive a reply.

(c) Safety patrols should be appointed in each room to warn the children, especially when dismissed.

(d) Safety mass meetings should be held in all school buildings, with a speaker furnished by the speakers' committee.

(e) Safety posters should be placed in the entrance and on the outside of each building.

5. *Slogan.*—"Don't Get Hurt" has proved by far the most effective slogan that has been used. This should be given wide publicity and played up in big red letters on posters and billboards.

6. *Publicity.*—The publicity campaign should begin a month before the opening of safety week. As each feature of the campaign is developed to a point where it can be announced, an article should be prepared outlining fully the activity. By this means there will be built up in the minds of the people an adequate picture of the scope and purpose of the campaign. This is absolutely essential to securing proper co-operation.

The following will suggest the sort of material which

At Left—The Treasury Department Display Emphasized the Bad Effects of Hurry. At Right—The Girls of the Interior Department Had a Good Motto

the publicity committee should prepare and furnish to newspapers:

Daily program (printed in a box).
News items.
Two-minute talks to mothers, signed by chief of police.
Interviews with prominent citizens.
Reports of talks given by speakers.
Picture showing hazards to children on the streets.
Daily score of accidents.

7. *Posters.*—If a safety week campaign is to be effective it must be visualized, must be so presented, that at every turn it will confront the driver and the pedestrian and remind them of safety.

This can best be accomplished by the use of posters bearing the slogan "Don't Get Hurt" printed in bright red on white paper. These posters are much less expensive than picture posters and are quite as effective.

The most striking poster display can be made by placing large posters, say 25 in. x 38 in. in size, at some 100 strategic street intersections. This can be done best by using thick sheets of heavy beaverboard arranged in

This Washington Railway & Electric Car Made a Tour of the City Each Day During Safety Week

triangular form around a lamp post or trolley pole at one of the four corners of the sidewalk. On the face of each side of the triangle a large poster, say 24 in. x 42 in., bearing the slogan "Don't Get Hurt" should be pasted. This display, if properly placed, will be seen by every driver and pedestrian. The same poster should be placed at all gasoline-filling stations, on public buildings, including schoolhouses; on vacant billboards and at highway entrances to the city.

A poster, say 18 in. x 24 in. in size, bearing the slogan should be carried on the front and rear of each street car. The co-operation of the owners of all commercial vehicles, including taxicabs, buses and trucks, should be secured so that they will carry triangular posters bearing the slogan on both sides of each vehicle.

Marking the streets at the crossings with broad white lines and with a large footprint in which is stenciled the slogan have proved to be most effective in visualizing safety.

8. *Parade.*—A spectacular parade, if properly organized, will impress large numbers of people who might not be reached by the other appeals. It should be short and snappy. Each municipal department, the principal industries, public utilities and civic bodies should be represented by floats. The one point to be emphasized is that each float should visualize in a graphic way the safety idea.

9. *Police.*—The police, if properly interested and instructed, can do much to make the streets safe during safety week. This interest can best be secured by arranging to have a speaker appear with the chief of police at one roll call at each station during the week preceding safety week. During safety week each policeman should wear a large celluloid button on which is inscribed "We are helping to make ————town safe."

10. *Industries.*—Each industry should be requested to do four things: (1) Blow the whistle at nine o'clock on the Monday morning of the safety week; (2) conduct a drive among its employees; (3) arrange for a mass meeting of employees, with a speaker from the speakers' bureau, and (4) place large posters at the entrances to the plant.

11. *Speakers' Bureau.*—A speakers' bureau, if properly directed, with a group of good speakers can do much to reach and interest the more intelligent citizens.

A printed leaflet containing data and suggestions should be furnished each speaker. It is comparatively easy to arrange for a speaker to appear before any luncheon, club or women's organization and in the larger industries before or during safety week.

12. *Motion Pictures.*—The motion picture houses should be asked to run slides with the slogan "Don't Get Hurt" and also safety films.

13. *Radio.*—Speakers should be furnished for all of the radio stations, and safety talks should be broadcast each evening.

14. *Scouts.*—The Boy Scouts and Girl Scouts delight in taking part in a safety week drive. Each scoutmaster, a few days prior to the opening of safety week, should instruct his troop regarding safety and ask each scout to pledge himself to set an example of safety, to warn others, and to save human life if the opportunity offers. Each scout should be furnished with a large button inscribed with the motto, "We are helping to make ————town safe."

A most spectacular stunt which has been used effectively in several cities is to have fifty boy scouts take the place of fifty traffic policemen for one hour at noontime on one day of the week. Boy scouts have also done effective service as guards for pedestrians, one being located on each of the four corners of the principal street intersections.

El Paso Foremen Profit by Vocational Training

By William Rouse
General Foreman El Paso Electric Railway, El Paso, Tex.

UNDER the auspices of the vocational department of the El Paso public schools, in co-operation with the state and federal boards for vocational education, the El Paso Electric Railway recently conducted a successful course in foreman training. It was started Sept. 14, 1922, and ended Jan. 4, 1923, meetings being held on Monday and Friday evenings each week from 7 to 9 o'clock. In all twenty-six meetings were held.

The course was divided into two main sections: (1) Processes of operation and (2) man factors. In each section the material was analyzed to bring out the cost elements, the supervisory and managerial responsibilities of the foreman, and ways and means of obtaining the co-operation of the working force, higher standards of production, increased production and a lower cost of production.

The conference group was made up of members of the mechanical department of the railway. The company furnished a classroom and cigars for the men, and in addition paid the local portion of the salary of the conference leader who had charge of the discussions.

The benefits which we have derived from the work are noticeable in the way in which the foremen handle their men, the way in which the men go about their work, and the way in which they co-operate with other foremen in the department.

At the completion of the course all members of the class expressed appreciation of the work and asserted that it had given them a different viewpoint as to a foreman's responsibility. Each member was given a certificate showing that he had successfully completed the course and had attended 80 per cent or more of the meetings. These certificates were distributed at a dinner given by the company in honor of the occasion, indicating that the efforts of the men to improve themselves were appreciated by the management.

Training for foremanship is essential in the electric railway industry. The experience which we have had on the El Paso property illustrates some of the general principles involved in this matter of vocational education. There have been three stages in the development of this education in this country, of which the first, the training of executives and technical experts, has received attention for a relatively long time. The second stage is concerned with the training of the working force, and is of comparatively recent development. The third stage, which is just beginning to receive attention, is the training of the man who stands between the executive and the work, namely, the foreman.

Foremanship Conference in Session, El Paso Electric Railway

The training of executives and technical experts has been done in our colleges and technical schools, and is well taken care of. Since the passage of the federal vocational education act, known as the Smith-Hughes law, rapid progress has been made in the efficient training of the working force. Today almost every city is conducting day trade schools, part-time schools and evening schools for the training of industrial workers.

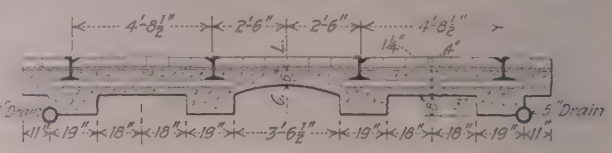
However, a chain is never stronger than its weakest link, and if we have trained executives and trained workers, then we must have trained foremen to make up an efficient industrial organization.

Industrial leaders have come to realize that the training for foremanship must be entirely different from that for executive responsibility or industrial work. The qualifications required in a good executive or an expert worker would not cover those necessary in an efficient foreman. For this reason foremanship courses are being conducted by many industrial organizations.

The method of putting on a foremanship course is to bring together a group of men having supervisory and managerial responsibility and to have them discuss their problems in accordance with the conference plan. The conference leader guides the discussion but does only enough talking to draw out the ideas for discussion.

Steel Tie Track in Youngstown Has Stood Hard Wear

SEVEN years experience with solid concrete and steel-tie construction has convinced the Youngstown Municipal Railway that this type of installation is the most satisfactory for tangent track. All new work, therefore, is being designed along these lines: Nearly



Concrete Construction with 134-Lb. Rail

9,000 ft. of double track was laid on Wilson Avenue in 1916 with monolithic steel-tie construction, and since that time almost no repairs have been needed.

The tangent track is built with 14-in. concrete foundation below the rail. International steel ties are used, together with 9-in., 134-lb. Trilby rail. The paving is of 4-in. Bessemer brick blocks laid on a 1½-in. cushion of sand. All joints are thermit welded. On curves, however, wood ties are used and the joints are not welded. A 5-in. tile drain carries off the water.

The trolley service on this track is fairly heavy, as all city cars, seventy-eight in number, pull out and pull in via Wilson Avenue. Moreover, there is a five-minute headway all day with safety cars, which drops to a two-minute headway in the rush hour, the trippers being heavy two-man cars. Prior to 1920 the all-day service also was operated with large cars, although not on such a short headway as prevails with the present safety cars.

A few joints pulled apart during the first winter after the track was laid, but since then there have been practically no joint failures on the tangent track. An exception should be noted, however, in the case of one joint exactly on the crest of a little hill, which pulls apart regularly once a year when the weather gets cold. With the monolithic construction there has been less trouble than usual because of water getting into the paving.

Since the completion of the Wilson Avenue job, track has been laid with the same type of construction on other streets, and it has proved uniformly satisfactory. A minor variation has been introduced by the use of 7-in. Trilby rail, and the depth of the trench for the foundation has been changed from 8 in. to 4 in. In some places the tile drain has been omitted. However, the monolithic construction with steel ties has been closely adhered to, and new work is being similarly designed.

Track in Good Condition After Seven Years of Service

Equipment Maintenance Notes

Testing Car Air Reservoirs

New England Company Has Developed a Routine Procedure Which Insures Maintenance in Good Order of This Important Part of Car Equipment

By W. C. Bolt
Superintendent of Rolling Stock and Shops, Eastern Massachusetts Street Railway, Chelsea, Mass.

MAINTAINING car reservoirs in a safe condition is considered of sufficient importance by the Eastern Massachusetts Street Railway to warrant more than the usual superficial examination for defects. Accordingly, this company has included a hydrostatic and hammer test as a part of the regular car-overhaul schedule.

Each air tank is subjected to a water pressure test at 100 per cent above the working pressure, and the entire surface of the tank is hammer tested to determine the general condition of the shell. The test has been particularly valuable for ascertaining the condition of tanks in service for five years or longer, many such tanks having been found worn thin under the supporting straps or to have developed leaks in the seams.

Tanks with minor leaks in the seams are brazed, retested and placed back in service, provided the body is in good condition. Those with body defects, including thin shells, are renewed.

The accompanying illustrations show the apparatus used in making this test. The reservoir is disconnected from the air system and one end is plugged. A ¼ in. bent pipe, inserted at the opposite end and extending to the top inside, permits removal of all air and indicates when the tank is filled with water. The tank is filled from the bottom, through a small hand water pump connected to the city water supply.

Equipment for Testing Air Reservoir with Hydraulic Pressure

Submit to Rolling Stock Department
Chelsea Office

REPORT OF HYDRAULIC PRESSURE TESTS ON AIR RESERVOIRS

Car No. *Date*

Tested at
(Shop or Carhouse)

Size Tank	Description	Working Pressure	Tested Pressure

Remarks:

Size Tank	Description	Working Pressure	Tested Pressure

Remarks:

Size Tank	Description	Working Pressure	Tested Pressure

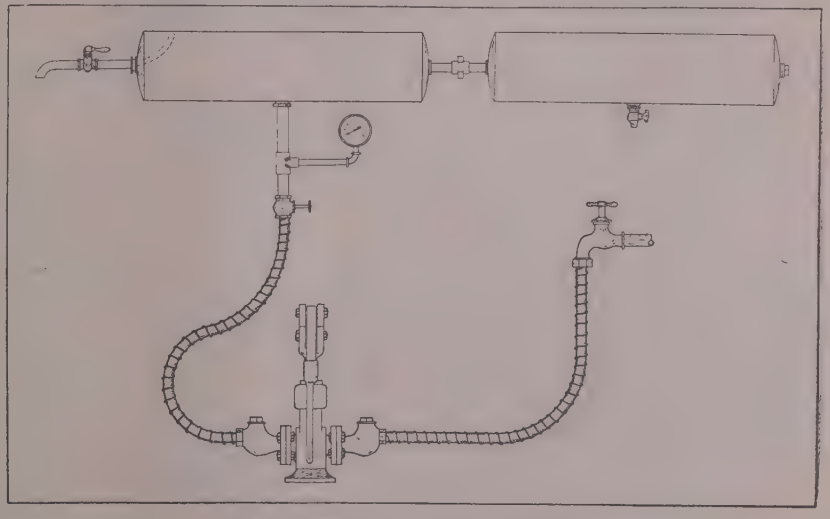
Remarks:

Signed, Air Reservoir Inspector

Signed, General Shop Foreman

NOTE:—Under "Remarks" state condition of tank as found by test, describe defect, if any. Indicate under this heading any tank renewal.

Form Used for Recording Results of Test



The Hydraulic Test Shown Graphically

CAR NO.

No Tanks	Size	Date In Service	Date Out Service	Working Pressure	Testing Pressure	Date Tested	Date Tested	Date Tested

CAR RESERVOIR TEST RECORD
EASTERN MASSACHUSETTS STREET RAILWAY COMPANY

CAR NO.

Date Tested	Date Tested	Date Tested	Date Tested	Date Tested	Date Tested	Date Tested	Date Tested	Date Tested

CAR RESERVOIR TEST RECORD
EASTERN MASSACHUSETTS STREET RAILWAY COMPANY

Face and Back of Record Card for Reservoir Test

After the tank has been filled, a few strokes on the hand pump build up the tank pressure to the value desired. A shut-off cock located between the pump and reservoir is then closed, maintaining the pressure on the tank until the examination by the inspector has been completed.

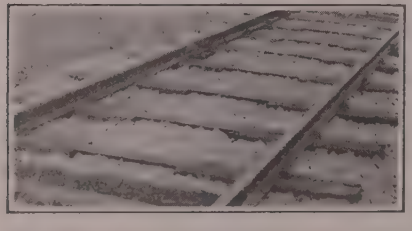
Reservoirs which have been tested are stenciled, indicating the shop at which the test was made, the test pressure and the date, arranged as indicated below:

150 lb.	TESTED Chelsea Shop	10-20-22

The reservoir inspector is required to submit a report, describing the condition of each tank and indicating the repairs or renewals made, and this information is recorded permanently in a card file.

Old Rails Used in Tie Construction

THE accompanying illustration shows a type of tie construction used to a limited extent by the Lehigh Valley Transit Company on its Easton division. Under this plan old rails with wooden side pieces are used as ties, and a tie is made 6 in. deep by 8 in. wide. The wooden pieces fit into the web of the rail and around the ball at the bottom. The running rail is bolted to the section of rail used in the tie, the nuts having lock washers and rail clamp pieces underneath. The wooden side pieces are bolted to the rail and are used to give a wider tamping surface.



Old Rails with Wooden Side Pieces Used in Tie Construction

This type of construction also provides for the desired resiliency and makes the operation less noisy. Another advantage of using the short side pieces is that they can be treated more readily by creosote methods than can ordinary tie sections. The short wooden pieces can be renewed without disturbing the old rail centers, and one man can remove the side pieces and install new ones without difficulty.

Three Simple Signal Systems

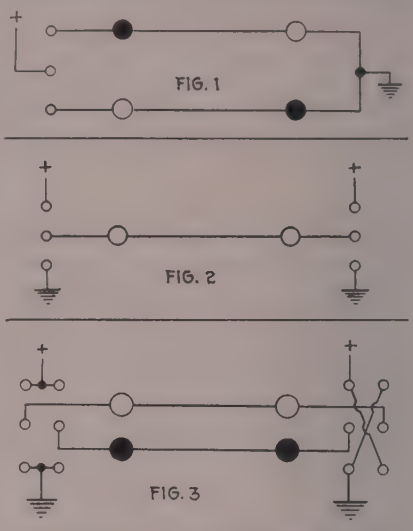
BY G. H. MCKELWAY
Distribution Engineer Brooklyn Rapid Transit Company

WHILE the use of automatic signals on electric railways has increased greatly due to the improvement of the systems on the market, yet there will always be places where manually operated signals will be useful, such as for temporary signaling, or where the first cost must be kept low. As electric railways must use electric current to operate cars and as most lighting is by means of incandescent lamps, the type of signal most easily installed and maintained is that in which the signal indications are given by the lighting and extinguishing of lamps using trolley voltage.

Because of the comparatively high voltage of the circuit, usually five or six lamps are burned in series, although the entire five or six lamps are not installed in one cluster at one end of the block but are divided, with three at one end and two at the other. The lamps at the far end of the block can thus be used to signal cars coming from that direction and those at the near end to control the movements of following cars and also to indicate to the trainmen operating the signals that the signals have acted properly at the far end.

The accompanying diagrams show three methods of connecting up such signals for the protection of cars operating over a single-track block. Fig. 1 is for use under circumstances where an inspector or station agent is located so that he can throw the switch which sets the signals at the end of the block. Each circuit is made up of red lights at one end and green lights at the other, and the lamp current is controlled by a single-pole, double-throw switch operated by the man in charge. If he cannot see the lamps at the ends of the block, one or two of the lamps from each circuit should be placed where he can see them so that he can assure himself at all times that the signals are properly set and that the lamps are burning.

The scheme shown in Fig. 2 requires but a single signal wire paralleling the trolley, and all of the lamps used are of one color, which should be either blue or white. Red lamps should not be used, as they would give a clear indication if one of the lamps should be burned out or become broken. The lamps in this scheme, as well as in the scheme shown in Fig. 3, are controlled by switches operated by the crews of the cars. If a motorman, upon reaching the signal, finds the lamps burning, indicating that the track ahead is clear, he throws the double-



Diagrams of Manually Operated Signals

Signals shown in Fig. 1 are for use where employees other than car crews are available. In Fig. 2 the circuit requires but one wire. The scheme shown in Fig. 3 insures definite indications.

throw, single-pole switch to the other position. He thus extinguishes the lights, and proceeds. When he has reached the other end and cleared the block he throws the switch at that end to its other position, which relights the lamps and indicates that another car can enter the block.

The fact that the lights, when out, may indicate either that the block is occupied or that one of the lights has gone out, and therefore that the indications are not always definite, is an objection to this plan which is overcome by the scheme shown in Fig. 3. In the latter two signal wires must be run between the ends of the block, and double-pole, double-throw switches are required. This plan, however, gives positive indications and if the lamps do not light up it is known that there is trouble in the circuit. Therefore there need be no delay before starting to make repairs.

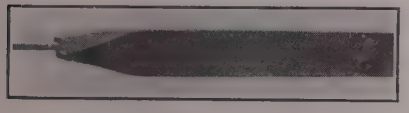
The lamps in these circuits are operated by the train crews in the same manner as with the scheme shown in Fig. 2, except that by throwing the switch to the other position the lamps are lighted and the other circuit of lamps that were burning before the switch was changed are extinguished.

The great trouble with all systems

where the switches are controlled by train crews is the possibility that they may also be altered by some mischievous persons and thus give wrong indications. The only way to prevent this is to lock up the boxes containing the switches so that unauthorized persons cannot tamper with them. Train crews will then need keys to these boxes or else switch handles which can be inserted through holes in the boxes, so that the switches can be thrown while the boxes are still locked.

Protecting Guy Wires

WHERE guy wires run down to the ground it is frequently necessary to install some warning device so that persons passing will not run into them. The accompanying illustration shows a light, neat protection that has been used with beneficial results. Instead of the familiar piece of pipe or wooden boxing, the wire is protected in this



Galvanized Iron Protection for Guy Wires

case by a long, narrow piece of galvanized iron with the ends bent to inclose the guy wire and the whole bent partly around it. The protection is held in place by means of clamps which pass through holes in the iron and fasten below the wire.

The guard illustrated was a protection provided in a high-class residence section and in this case it was painted green so as to blend with the surrounding foliage. In some localities where it is desirable to make the protection more prominent it no doubt would be better to paint with a color which would be more conspicuous. White is particularly desirable as it can be seen more readily after dark.

Truck Stands Reduce Overhauling Time

THE accompanying illustration shows a type of truck stand used by the New York Municipal Railway Corporation in its Thirty-ninth Street shop. Trucks are placed on these for overhauling in order to bring the parts of the truck to a convenient height so that the workmen can accomplish their work with a minimum of physical exertion and a considerable saving in time. The

Truck Stand Enables Workmen to Accomplish Their Tasks with a Minimum of Physical Exertion and Time by Working in an Upright Position

use of these truck stands also provides space underneath for doing work which otherwise would require the placing of the truck over a pit, and thus additional handling is saved.

The two top members on which the truck wheels rest are constructed of standard T-rails. These are fastened together by cross members at the ends. Standard angles 2 in. x 6 in. in dimensions are used for this purpose. The feet or supporting members are constructed of ¾-in. x 6-in. iron plates which are bent to give the necessary floor support and to provide a means for riveting to the T-rails. The corners of the framework are further strengthened by gusset plates. As constructed, the truck stand is 12 in. from the floor to the top of the rails. The ends of the rails are bent upward so as to do away with the danger of the truck sliding or rolling off the framework.

The Roadmaster Has the Right-of-Way

"WHEN are we going to have our picnic this year, Tom?" asked Charlie Riter, the clerk of the general manager of the Jinxville Electric Railway, as he greeted Fairweather, the roadmaster, one fine May morning. "Seems to me we ought to be planning for it soon, before the weather gets too hot."

"You're right, Charlie, it's too bad that our heavy traffic on Memorial Day makes most of us work extra hard that day, or we could go then. I'll take it up with the chief right away. Is Mr. Redfield in this morning?"

"Yes, he's in his office, Tom; go right in."

Fairweather knocked on the G.M.'s door and heard the cheery "Come in," which always made the fellows feel that they were welcome.

"What's on your mind?" Mr. Redfield asked, as Tom entered. "Picnics," the latter replied. "Don't you think we ought to be getting our plans laid? Our people kind of feel out of it on Memorial Day when they have to work hard to give everybody else a good time. If they knew a picnic of their own was coming off soon the case would be different. The blow-out we had last year was a great success. Remember that potato race between Ole Olson, the machine shop lathe hand, and "Whistlin' Dick Singer? Some race, I'll say; I laugh about it yet."

"All right, Tom. I guess the boys deserve an outing, the way they have been pulling together this spring to get the road back in shape. Why don't you head up a committee to get the thing going? I'll ask O'Neill to represent the line department; Bill Gainway can serve for the platform men, Jones for the shop and my clerk, Charlie Riter, for the office force here. If that's all right, it's up to you to get busy."

"I'll get busy, all right. Can I spend a hundred dollars or so on posters, prizes, etc., to help the thing along?"

"Yes, the company will put up a hundred, and your welfare association would probably like to help, too. I'll put up a cup personally for the best all-round athlete in the bunch—provided he isn't too lame to work the next day. Bill Gainway will arrange for specal cars. When will you have the picnic? Or shall we call it a field day?"

"Early in June, I think. There seems to be a picnic spirit in the air around about Decoration Day. I'll get my committee together tonight at the house and we'll lay some plans. Thanks for that cup. I know the boys and their families will appreciate it."

Mirror Saves Current in New Edinburgh Destination Signs

THE practice of the Edinburgh Tramways, Scotland, is to indicate the destination of its cars by colored panels and large numerals prominently displayed in a route number box. Painted tin slides are used by day, and at night transparent glass slides through which shines the light of two electric bulbs

Route Number and Color Mounted Conspicuously at Top of Car

Box Open, Showing Position of Lights and Diagonal Mounting of Mirror

inside the box. Half the face of the box is devoted to the number, and the other half is divided into two small color panels, because the large number of routes makes it necessary sometimes to use two colors to identify a line. Both of the electric lights in the illuminated route number box are placed in the color half, and the numeral in the other half is lighted only by reflection from a mirror. It is claimed that the use of a mirror placed at an angle as shown in the accompanying illustration has saved the use of two additional electric lights.

Stripes Show Location of Fire Apparatus

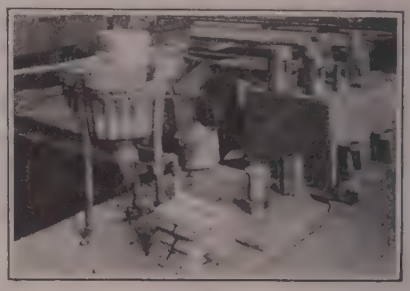
ACCORDING to the insurance rules, every carhouse must be equipped with a specified number of sand pails and extinguishers for fire protection. The value of this equipment depends largely on its instant availability when a fire threatens, as a delay of even a few seconds to locate the fire apparatus is dangerous.

In order that the fire fighting equipment may be quickly located by the men in an emergency, the Beaver Valley Traction Company, New Brighton, Pa., at its Junction Park carhouse has adopted a novel method of indicating the position of extinguishers and pails. The correct location for each of these is indicated by a red space approximately 18 in. square, painted on the white wall. When the house is filled with cars, it may not be possible to see these red spaces, so red stripes are painted vertically upward from the location of the apparatus to a point near the roof. A broad stripe is used to indicate an extinguisher and a narrow one a sand pail. The upper ends of these red stripes may be seen above the car roofs, and the apparatus is located without difficulty. These stripes are so prominent that there is no excuse for delay in finding the equipment.

When the fire equipment has been removed, either for fighting fire or for other purposes, it may or may not be returned to its place. These red spaces and lines are so prominent that they help to overcome carelessness in keeping the equipment away from its proper location, as even a casual inspection will indicate the absence of any equipment.

Making Bearings of Frary Metal

THE Lehigh Valley Transit Company, Allentown, Pa., uses Frary metal for all types of bearings. This is melted in the ladle in the gas furnace shown at the left in the accompanying illustration. In the melting equipment there are two pipes, one for air and one for gas. Both are regulated to give the desired flame. All kinds of bearings are cast in molds similar to the one shown at



Equipment Used for Pouring Bearings at Allentown

the right for armature bearings.

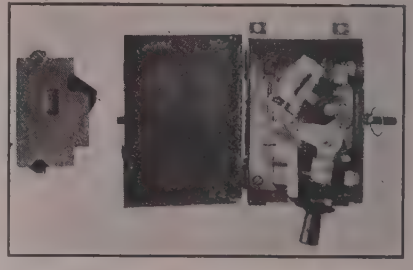
As a result of the use of this metal, together with the method used for making bearings, the company has overcome many bearing troubles.

New Equipment Available

New Circuit Breaker for Electric Railways

THE General Electric Company has recently developed a new line of hand-operated inclosed circuit breakers, known as type M R 22.

Superseding the M R 10, 11 and 12 types of circuit breakers, the new



Circuit Breaker with Easily Removable Arc Chute

units are superior mechanically and are 6 lb. lighter. They are of particularly rugged construction for railway service, with simple parts easily adjustable and readily accessible for repairs or inspection.

An interesting feature is that the arc chute may be removed without tools by raising a latch inside the box cover which releases the chute. The arc chute is also equipped with an arc suppressor plate which reduces the volume of the arc blowing into the car.

Association News & Discussions

Electrification Largely a Financial Problem*

By W. R. STINEMETZ
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

TRANSPORTATION today is one of the most important and essential business enterprises of the country. We have a great network with 253,000 miles of track, 65,000 locomotives and 2,500,000 cars. In the month of January, 1923, the gross earnings of the railroads were $500,810,000, with net earnings of $93,280,000, on a valuation of about nineteen billions of dollars.

American railroad development has been made with the steam locomotive, and it will no doubt for some years to come be the chief motive power. The questions of today, however, are those of efficiency and economy in operation and more intensive use of present facilities, and it is such questions that electrification is expected to solve where conditions warrant its application.

The study of railroad electrification presents two problems: First, we must demonstrate that electrification is adequate from an engineering and operating standpoint, and, secondly, we must justify financially the large investment required.

Electrification has proved to be the most reliable and economical means of transmitting power in railroad work. The electric locomotive has been successfully applied in all phases of railroad service, and has been utilized largely to overcome restrictions in operation caused by increase in traffic, which were unsurmountable with the steam locomotive.

Four Applications of Electrification

Its first application was to permit more freedom of movement in tunnels by eliminating the smoke of the steam locomotive. The trackage capacity of the Hoosac tunnel was increased fourfold by electrification, and the Simplon tunnel could hardly have been operated at all with steam.

The second application of electric motive power was to multiple-unit electric cars as a substitute for the steam suburban train. Elimination of shifting movements of engines and more rapid acceleration of trains has greatly relieved the trackage congestion of large terminals.

Mountain grades were the third application where electric operation surpassed in economy, capacity and reliability the best performance of the modern steam locomotive. Grade sections, when electrified, are no longer the limiting factor to the maximum tonnage which can be put over a railroad system. The Norfolk & Western Railway, whose Elkhorn grade is the heaviest tonnage mountain electrification in the world, now handles heavier tonnage trains at twice the speed of steam operation.

The fourth and final demonstration of the fitness of the electric locomotive was in the complete electric operation of several divisions of a transcontinental line. The Chicago, Milwaukee & St. Paul Railway is now operating all trains electrically over four of our principal mountain ranges. The electric passenger engines on this road make a daily run of 440 miles, with monthly averages of 12,000 miles, and individual engines have made runs of 766 miles in a twenty-four-hour period.

Problem Is Financial Justification

While electric operation has been successfully applied in the United States to fourteen different trunk lines, on 2,500 miles of track, and involving 354 electric locomotives, this represents only 1 per cent of the total steam tonnage and mileage in our country. The question which naturally arises is, why has not electrification been more seriously considered and adopted by our railroads? This brings us to the second problem, namely, that of financial justification.

Electrification is a betterment which requires a large amount of new capital investment, and to be attractive it must pay for itself by economies effected; its application, therefore, presupposes a condition of congested traffic.

Railroad electrification is advancing rapidly in such foreign countries as France, Japan, South America and others, under definite programs of expansion. In these countries the fuel situation is such that economies of operation obtained by utilizing hydroelectric power with electric locomotives, as compared to high-priced coal with steam locomotives, are sufficient to justify such investments of capital. No such condition exists in our country. Fuel costs on American railroads represent only 11 or 12 per cent of the total operating expense, while the fuel costs of the Swedish state railways were reported, during the war, to have been 50 per cent of the total operating expense.

A recent study of electrification on a mountain grade section of one of our heavy-tonnage railroads showed that, with coal costing $3 per ton and electric power at three-fourths of a cent per kilowatt-hour the power cost with steam operation is approximately the same as with electric operation, when maintenance charges for the substation and distribution systems necessary to get this power to the electric locomotive are included. With coal at $15 to $40 per ton in these foreign countries, and the price of hydro-electric power about the same as our own, the reason for their activity is at once apparent.

There are, however, other ways in which electrification can be justified on certain sections of some of our heaviest traffic systems. Our present business expansion is already demanding increased railroad capacity, future increase in which will be secured largely by using more efficiently the trackage which now exists. Electric operation will remove some of the inherent limitations of steam operation and thereby permit economic expansion in railroad work, just as it has in other industries.

One of the limitations of steam operation is labor. The higher wages and labor shortage now existing and which will continue to exist are an increasing handicap. The performance of electric equipment during periods of reduced maintenance and inspection has been well established. The effect of labor troubles on steam operation will only be magnified as this class of operation becomes more congested.

A second limitation is the extensive facilities required for steam locomotives, especially at terminals. The removal of coaling and watering stations, engine house facilities, inspection sheds and turntables and the speeding up of shifting movements and train makeup at terminals will all permit a more intensive use of present track facilities.

A third limitation results from the fact that the steam locomotive will always be an uncertain factor in the rapid movement of freight under adverse weather conditions. Its maximum capacity is fixed by the fact that it is a self-contained unit. This, in turn, is subject to its condition of overhaul and inspection, the quality of coal and the weather. The electric engine will always perform at its rating and, in addition, is good for short overloads, and has improved rating at lower temperatures. Cutting of tonnage rating and slowing up of trains at the very time when the maximum power is needed is a severe handicap to efficient operation.

If we expect the railroads to keep pace with our constantly increasing productivity, means must be provided for improvements and betterments in facilities and equipment. New capital

*Abstract of paper presented before the Rochester, N. Y., Chamber of Commerce, April 27, 1923.

cannot be obtained unless the railroads are allowed to earn sufficient to pay a reasonable return on the investment. Electrification is one of the major betterments which can be effected with sufficient resulting economies to carry all charges on the capital investment. Every existing electrification has successfully demonstrated this fact.

C.E.R.A. Committees Announced

THE committee appointments of the Central Electric Railway Association for the year 1923 are announced with the publication of the Association's "Brown Book." The committees are as follows:

Auditing: Tudor W. Jones, auditor Union Traction Company of Indiana, Anderson, Ind., chairman; J. S. Clark and F. E. Belleville.

Constitution and By-Laws: Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, chairman; F. R. Coates, C. N. Wilcoxon, F. D. Carpenter and A. C. Blinn.

Finance: Harry Reid, president Interstate Public Service Company, Indianapolis, chairman; S. W. Greenland and Robert I. Todd.

Hotel and Arrangements: S. D. Hutchins, Westinghouse Traction Brake Company, Columbus, Ohio, chairman; Harry L. Brown, John Benham, James H. Drew, J. A. Donahey, C. Dorticos and L. P. Morris.

Safety: Charles B. Scott, manager Bureau of Safety, Chicago, chairman; Neal Funk, J. H. Alexander, L. C. Bewsey, G. S. Wills, J. B. Stewart, E. M. Walker and James Harmon.

Program: Harry Reid, president Interstate Public Service Company, Indianapolis, chairman; M. Ackerman, J. C. Schade, I. W. Hansen and W. S. Rodger.

Publicity: J. S. Bleecker, general manager Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, chairman; Harry L. Brown, H. J. Kenfield, E. B. Atchley, J. A. Greenland, E. F. Wickwire and H. A. Nicholl.

Resolutions: Joseph A. McGowan, secretary Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, chairman; R. A. Crume, J. F. Starkey, Walter Shroyer and Gus Mulhausen.

Rules Governing Interchange of Equipment: C. S. Keever, general superintendent Union Traction Company of Indiana, Anderson, Ind., chairman; E. B. Gunn, P. L. Radcliffe, G. K. Jeffries and C. C. Fast.

Transportation: L. M. Brown, general superintendent Interstate Public Service Company, Indianapolis, chairman; G. K. Jeffries, J. A. Greenland, C. S. Keever, F. W. Brown, R. N. Graham and J. Frank Johnson.

Supply Men: Myles B. Lambert, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., chairman; C. C. Creighton, J. A. Donahey, E. C. Folsom, W. D. Hamer, C. T. Dehore, H. H. Buckman, S. W. Crawford, E. J. Smith, E. S. Sawtelle, G. L. Kippenberger, James C. Jameson and Robert J. Deneen.

Uniform Charges for Repairs to Interchanged Equipment: E. M. Walker, general manager Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., chairman; A. W. Redderson, P. V. C. See, R. C. Taylor, J. F. Elward and G. H. Kelsay.

Membership: A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, Akron, Ohio, chairman; William Harton, E. M. Walker, J. Frank Johnson, Myles B. Lambert.

Annual Transportation: G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, chairman; Harry Reid, J. S. Bleecker, H. A. Nicholl, S. W. Greenland.

Standardization of Traffic Signal Colors

FORTY-TWO men, representing the manufacturers and the users of traffic signals, federal and state governmental departments, associations interested in the prevention of traffic accidents and representatives of the general public, are drafting a national code on the proper colors for traffic signals, which it is expected will not only cut down the annual loss of life through traffic accidents, but will eliminate many of the existing irritations to motorists and the operators of steam and electric railways.

This work is being carried on under the auspices of the American Engineering Standards Committee. The sectional committee drafting this code is made up of representatives of the manufacturers of traffic signals, purchasers of such equipment, the users of traffic signals, governmental bodies, technical specialists and insurance representatives.

Charles J. Bennett, State Highway Commissioner of Connecticut, who represents the American Association of State Highway Officials, is chairman of the sectional committee; M. G. Lloyd of the United States Bureau of Standards, representing both the bureau and the American Society of Safety Engineers, is vice-chairman, and Walter S. Paine, research engineer of the Aetna Life Insurance Company, who is the representative of the National Safety Council, is secretary.

Canvass on Wheel-Tread Width

THE Central Electric Railway Association has just recently been conducting a canvass regarding the opinions of members on the narrowing of interurban wheel treads to 3 in. Of the twenty-two companies that have replied to date, fifteen do not favor the change; two are willing to change a part of the present equipment to continue through traffic arrangements, the city of Detroit having specified the 3-in. tread for cars operating over its tracks; one is willing to change all equipment to take care of traffic arrangements, and four are now using the narrow tread. Considerable difficulty has been experienced in this territory from the use of narrow wheel-tread equipment due to derailments, which occur particularly in the spring.

American Association News

Committee on Rail Head and Wheel Contours Holds Busy Meeting

A MEETING of the Engineering Association special committee on wheel tread and flange and railhead contours was held in New York on May 11. The following members and guests were present: H. H. Adams, chairman, Chicago; J. H. Hanna, vice-chairman, Washington, D. C.; C. A. Alden, Steelton, Pa.; V. Angerer, Easton, Pa.; George L. Fowler, New York, N. Y.; J. F. Miller, Pittsburgh, Pa.; H. F. Heyl, Easton, Pa.; W. F. Graves, Montreal, Canada, and E. M. T. Ryder, New York, N. Y.

Designs of wheel treads and flange contours were decided upon which will be recommended to supersede the contours now standard and included in the Engineering Manual under Section Et-4a. Recommendations for contours of chilled iron and steel wheels were also decided upon. Revision of wheel dimensions and the present wheel mounting gage will be made so as to revise Manual sections Et-7b and Et-18a. The committee considered it inadvisable to recommend a change in the head of the present plain girder rail at this time.

Service Bulletins Now Available

THE following special reports have been prepared for the use of member companies in good standing:

Wage Bulletin 127 Revised: A new edition of the wage bulletin, which combines in one compilation the original bulletin issued on Sept. 1, 1922, and all of the monthly supplements showing changes to May 1, 1923.

Use of Reduced Rate Tickets and Transfers: A tabulated statement showing for a large group of companies the cash fare, ticket rate, transfers issued, the proportion of revenue passengers using reduced rate tickets and proportion using transfers, whether revenue or free, during 1922 and 1921.

Allowances for Going Value in Valuation Cases: A summary of court and commission decisions in valuation cases in which the questions of allowances for going value was brought up. The decisions are grouped by states and thus serve to indicate the attitude of the various states toward this question.

Trend of Material Prices: A new edition of the association's compilation, bringing down to date the trend of prices of materials used by electric railways as furnished by manufacturers.

Motor-Bus Operations: Gives operating figures of the Washington Rapid Transit Company for the first three months of 1923, a six-month statement for the buses operated by the United Electric Railways, Providence, R. I., and the combined operating statement of the California bus lines as compiled by the California Railroad Commission.

The News of the Industry

Bid Made for Co-operation

New York Transit Commission Urges that Transit Construction Matters Be Taken Up Frankly

George McAneny, chairman of the New York Transit Commission, has made an offer to co-operate with the Board of Estimate of New York City in getting subway construction under way at once, reconciling wherever possible the differences between the Mayor and the commission, so that the imperative need to relieve congestion might be met. His proposal was contained in a letter sent to the Board of Estimate on May 16. He urged that differences of opinion as to the value of certain routes be taken up frankly in conference as early as possible, and offered to meet the board half way in adapting the plans of the Mayor and the commission so that they might be molded into a complete, harmonious system.

Mr. McAneny pointed out that the Board of Estimate in the last two years had refused to approve any measures presented by the commission and that the responsibility of the Transit Commission and the Board of Estimate was a joint responsibility "beyond the possibility of either body to alter at the present time." He referred to the plan of the commission for a five-year building program, to cost $225,000,000, submitted a year ago, and to Mayor Hylan's five-year building program, based on a different arrangement of lines, some of which, Mr. McAneny said, were "wholly feasible." The commission would be glad to take up the Mayor's proposals if they would be submitted to the commission, and would be prepared to accept any change in its own program that would not be antagonistic to certain basic principles of construction and operation.

Mr. McAneny said that the most important work before the commission and the board was the proposed construction of the crosstown subway in Brooklyn and Queens and the Washington Heights extension from Fifty-ninth Street and Broadway. The former plans of the commission for these two lines have been revised to conform substantially with those proposed by Mayor Hylan, he said. The other parts of the commission's program which could be made to agree with the Mayor's plan were the Corona-Flushing extension, the extension of the Fourth Avenue subway in Brooklyn, and the Nassau Street line in Manhattan. These five projects would cost from $100,000,000 to $125,000,000, said Mr. McAneny, which would exhaust the funds the city would have available for subways for a year, and he urged that immediate action be taken with a view to getting this work under way.

Board Revokes Bus Permit

Because they violated the terms of the conditions under which their permits were issued Fred B. Sheldon & Son and Cornelius Jewell were ordered to discontinue the operation of their buses between Dover and Wharton, N. J. The complainant was the Morris County Traction Company, Dover, N. J.

The decision of the Utilities Board in this case is outstanding in that it is said to be the first time under the 1921 act that a previous order approving bus grants has been canceled.

The traction company charged the bus operators with violating a stipulation that they would not take on or discharge passengers while operating in Main Street and Blackwell Street in Wharton and Dover and also that they did not conspicuously display a sign notifying the public that no passengers would be taken on or discharged within the two points mentioned.

At the hearing the electric railway produced several witnesses who testified to the offenses charged by the traction company. The board pointed out that the defendants in effect admitted the violations and attempted to excuse their conduct by saying that it was a matter of violating the conditions of the grant or violating a permit to operate issued by the municipalities.

Permission to operate three buses between Dover and Wharton was granted to the above-mentioned defendants on Feb. 8 last.

Settlement Has Been Reached in Birmingham

Conferences Growing Out of "Jim Crow" Agitation Result in Agreement Practically Eliminating Jitneys and Providing Among Other Things for Reduction in Fare—End of Receivership in Sight

EARLY reorganization of the Birmingham Railway, Light & Power Company is expected as a result of a general agreement between the city of Birmingham, Ala., and the company, according to a joint statement of Lee C. Bradley, receiver, and J. S. Pevear, president and co-receiver of the company.

Settlement of all issues between the city and the company has been effected and was ratified by the City Commission by a unanimous vote at its regular meeting on May 8. An ordinance and a series of contracts, which was made a part of the ordinance setting forth the terms of the settlement, were formally adopted by the commission.

The principal features of the agreement are as follows:

Jitneys are practically eliminated by regulation. They are prohibited from operating on any street on which there is a car line or on any street paralleling and within two blocks of a car line. A surety bond of $10,000 is required from all jitneys allowed to operate, suburban jitneys and buses operating to outside territory excepted. Licenses for operation of jitneys are raised to $100 a year, with increasing licenses above a specified passenger-carrying capacity. Permits are required from the City Commission for the operation of any jitney and a necessity for their operation must be shown before the permits may be issued. Refund of half of the year's license to jitneys is provided.

Cash fares are reduced from 8 to 7 cents. Ticket fares are reduced from 6⅔ cents to 6 cents and are to be on sale at conveniently located places in books of twenty tickets for $1.20. Fares fixed are maximum, the company binding itself not to ask an increase inside of three years, though the city is free to ask a decrease in fares should conditions warrant such action.

Jim Crow ordinance recently adopted by the city will be enforced, but in modified form. Cars with separate entrances for white and negro passengers are to be provided upon all lines except the Highland Avenue and Lakeview line, the Loop lines, the Mount Terrace, Roebuck Springs and Rugby Highland lines, which will retain one-man cars. Movable partitions separating the portions of the cars occupied by white and negro passengers will be used on all lines. These partitions will extend from the aisle edge of the seat back to the top of the window.

Company will install 100 street lights at once and others as ordered. A reduction of from $54 to $48 a year in the price of maintenance of arc lights is made. The contract covers a ten-year period.

Conferences between the city and the company on questions of service are provided under the agreements.

Jitney regulations provided and carfare reductions made are to go into effect on July 1. It is provided that should the enforcement of jitney provisions be held up by litigation or an election fare reductions and other provisions of the agreement shall be held up pending the result. The agreement is a general one and is made with the provision that if submitted to a vote of the people it shall stand or fall as a whole. However, the company is proceeding with plans to put the Jim Crow provisions into effect at once.

Orders are to be placed for twenty new cars as soon as bids can be obtained. According to present plans the new cars are to be of a large type with side entrances, the doors being toward the rear, leaving about two-thirds of

the car for white and one-third for negro passengers and providing effective separation of the races. Cars of a similar type are now in operation on the Tidewater lines. The cost of the new cars is estimated at something like $14,000 each or a total of $280,000 for the twenty.

The work of remodeling equipment now in operation is to start at once, Mr. Pevear stated. Ten large cars now equipped for pay-as-you-enter operation on the West End lines will be remodeled. Nineteen one-man double-truck cars will be remodeled for two-man operation with separate entrances. All of this work will be done in the local shops.

Action on the proposed settlement came after a lengthy series of conferences between City Commissioners and the co-receivers of the Birmingham Railway, Light & Power Company. The settlement followed the adoption of the Jim Crow ordinance by the city. This ordinance was to have become effective on April 15. Shortly before that date a conference between the commission and company representatives was held and it was suggested that the conference go into the question of a general settlement. The City Commission at an adjourned meeting on April 12 extended the time limit for the enforcement of the Jim Crow ordinance thirty days, or to May 15, pending the outcome of the conference. After several conferences the terms of the agreement were reached and the matter was turned over to W. J. Wynn, city attorney, and Mr. Bradley, receiver, to be put into proper form.

Jitney Operators Protest

Two meetings of jitney operators have been held, but their attorneys state that no definite course of action has been decided upon. However, funds have been subscribed by the jitney operators to make a fight in the courts.

Under the commission act, by which Birmingham is now governed, it is provided that such matters may be submitted to a vote on the presentation of a petition signed by 1,500 qualified voters. The election having been held, the law provides that the ordinance adopted by the voters at the election cannot be modified or amended by the City Commission and can be repealed or amended only by a majority vote of the people at an election. Members of the commission have expressed confidence that the settlement will be upheld if the issue is submitted to a vote, and it is generally believed that the jitney interests will hesitate to call an election.

The City Commission issued a statement following the adoption of the ordinance setting out the position of the commission and expressing the hope that the matter might be submitted to a vote. The commission declared that it is ready to enter into an election and fight to sustain its settlement.

Between 200 and 300 jitneys have been in operation in Birmingham for some time.

Representatives of the railway have assured the commission that the company will be in a position adequately to care for any added traffic when the ordinance takes effect.

D. C. to Replace Single Phase—Indianapolis Line to Be Extended 50 Miles to Cincinnati

The board of directors of the Indianapolis & Cincinnati Traction Company, of which Charles L. Henry is president, took definite action on May 15 to re-equip the present single-phase system for 600 volt d.c. operation. The plan calls for the purchase of new rolling stock, probably twelve new all-steel multiple-unit cars, and extensive rehabilitation of the present track and overhead. All of this is in preparation for an early extension from Rushville to Cincinnati, thus carrying out the original idea of the promoters to provide service between Indianapolis and Cincinnati.

The authorized expenditure for re-equipping the present lines is $767,271. It is planned to award contracts very shortly for this work. The present system comprises 101 miles of line and fifteen motor passenger cars, six motor freight cars and about thirty other cars. The extension to Cincinnati will require the construction of about 50 miles of new line running through a fertile farming territory not served by any railroad at present. The company plans to purchase its power. A three-phase transmission line will be built to connect with nine automatic substations.

The existing system is being placed in condition to tie up at once with the new construction.

Reports of Floods in Arkansas Exaggerated

Only a temporary suspension of the water, gas, telephone and electric railway service followed as a consequence of the flood, fire and cyclone which on May 14 wrecked the business district of the city of Hot Springs. Delay to the railway service was caused largely by the flooding of Central Avenue, which made the avenue, lying at the bottom of the valley, a rising river for a short time. On May 17 the street cars were again operating on all lines. The utilities sustained only minor damages. These were confined to the blowing down of wires, breaking off of a few fire hydrants and washing out of about 8,000 bricks in the pavement between car tracks. W. J. Boyer, secretary-treasurer of the Citizens Electric Company, operating the gas, electric and street railway service in Hot Springs, reported on May 17 that conditions there are again normal.

No Settlement in Pittsburgh,—The matter of a wage agreement and working conditions for the employees of the Pittsburgh Railways was still under discussion on May 15.

Philadelphia Report Under Attack

Common Council and Rapid Transit Company Do Not Agree with Its Findings

The special report presented by the Mayor's Transit Advisory Board in Philadelphia on the proposed high-speed lines in that city has been the subject of vigorous debates at conferences called by the Mayor to consider the topic. It has also been the topic of advertisements published in the daily papers by the Philadelphia Rapid Transit Company.

Synopsis of Report

The report was submitted under date of April 24 to Mayor Moore by the special commission consisting of Milo R. Maltbie, chairman; Morris L. Cooke and Francis Lee Stuart. This committee was appointed by the Mayor on Feb. 24 to consider the plans of the Broad Street subway, delivery loop, and other authorized high-speed lines, as heretofore prepared by the Department of City Transit. In its report the committee recommends as the first step a subway on Broad Street for pretty nearly its entire length or from Olney Avenue on the north to League Island Park on the south. About half of this would be four tracks and the rest two tracks, but the two-track sections would be so built that they could be changed to four tracks later. In addition the commission recommends a two-track branch subway leaving the Broad Street subway at Arch Street and going under Arch, Eighth and Locust Streets, back to Broad Street and then extending west on Locust and Walnut Streets to the Schuylkill River and then as an elevated line to Darby. In this respect the report recommends something like the Taylor plan, of a loop under these streets. Other recommendations contemplate the inclusion of the Chestnut Hill branches of the Pennsylvania Railroad and the Philadelphia & Reading Railway with the city-owned high speed line, a line over the Delaware River bridge now building and the adoption as standard for all these lines of a gage of 4 ft. 8½ in.

The significance of the last recommendation will be understood from the fact that the present Market Street and Frankford elevateds, operated by the Philadelphia Rapid Transit Company, have a gage of 5 ft. 2 in., the Philadelphia surface lines of 5 ft. 2¼ in., and the surface lines in Camden of 5 ft. The committee points out, however, that the steam railroad suburban lines, which it suggests should be taken over as feeders, have the standard gage and this cannot well be changed because they will still have to be used for the haulage of freight. It adds that if the Market Street and Frankford lines should have to be connected with the proposed subway later, they can be changed to standard gage without serious inconvenience.

In the introductory part of the report,

the committee says that the population of the city in 1920 was 1,823,779, and it is expected that by 1950 the population will be 2,743,000. The report points out that the traffic in Philadelphia has increased rapidly, as shown by the following table:

City	Period	Per Cent Increase Population	Traffic
Philadelphia	1910-1922	22	79
New York	1909-1919	19	44
Cleveland	1910-1919	38	71
St. Louis	1910-1919	11	14

The recommendations of the rapid transit committee are not in accord with the so-called "City-Company Plan" for better transit in the downtown district, recommended by the Philadelphia Rapid Transit Company and described on page 382 of the issue of this paper for March 3. The report of the Mayor's committee has also met a snag in the City Council, which on May 3 adopted a resolution providing for the appointment of a transit commission composed of the president of the City Council, a councilman from each of the eight districts, and a representative each from the Chamber of Commerce, Manufacturers' Club, Real Estate Board, Builders' Exchange, Operative Builders, and United Business Men's Association, with the Mayor as chairman.

The position of the Philadelphia Rapid Transit Company is stated by Chairman Mitten in a recent issue of "Service Talks" for May 8 where he argues that the case of the city and the company is like that of landlord and tenant. The company, the tenant, requires added space in the center of the city to meet increasing traffic needs, while the city, the landlord, finds the capacity of these streets required for the exclusive use of other traffic. The city and the company should solve this problem as any other landlord and tenant and make an arrangement for the transfer of street car tracks from the streets underground, and that the city and the company should co-operate in planning for future rapid transit lines.

To this the Mayor replied that the "tenant" had promised to do certain paving and charge only a 5-cent fare, but without the consent of the city had got rid of its paving and was charging a 7-cent fare, though it was paying 6 per cent dividends and erecting "super" funds for various purposes. Because it had control over all of the surface lines in Philadelphia and of the elevated and subway lines that have been built, the Mayor saw no reason why competition should be denied the sovereign (landlord) if any other operator should appear or if he should decide to provide the service himself.

Portland, Me., Men Seek Wage Advance

Trainmen employed by the Cumberland County Power & Light Company, Portland, Me., are seeking a wage increase amounting to 10 cents an hour. The men have been receiving 50 cents an hour. Operators of the one-man cars, who have been paid 55 cents an hour, are seeking an increase to 80 cents. The men now involved are the same men who a year ago submitted to a voluntary 10-cent wage reduction in order to decrease the deficit in the railway's earnings. A new agreement prepared by the men was submitted to the company several days ago and conferences have been held from time to time. The old agreement expired on May 1.

Town Wants Railway

South Jacksonville Ready to Spend $100,000 to Secure Service, but Wants Road Privately Managed

A municipally owned electric railway operated for the town by a private company appears to be in prospect for South Jacksonville, Fla., a town of approximately 3,500 population lying across the St. John's River from Jacksonville, with which it is connected by a highway bridge owned by Duval County, in which both Jacksonville and South Jacksonville are located.

The people of South Jacksonville have for some time been anxious to have the Jacksonville Traction Company extend its line across the toll bridge and into South Jacksonville. Just at the present time, however, there is not enough business in sight in South Jacksonville to warrant an expenditure on the part of E. J. Triay, receiver of the railway, of $100,000 to build and operate the line. The citizens of South Jacksonville realize, though, that in order for their town to grow and develop as it should it is necessary for them to have some means of transportation between their town and Jacksonville.

Bus Proposal Defeated

An election was held on April 10 to determine what should be done. The issue was put to the people in a general referendum to vote on three propositions:

1. Should South Jacksonville issue bonds in an amount of $100,000 to build and equip a street railway system connecting with the Jacksonville system?
2. Should South Jacksonville issue bonds in an amount of $30,000 to equip a motor bus line, running between South Jacksonville and Jacksonville?
3. A negative vote against either proposition.

Bus advocates were prominent and busy in trying to induce the people of South Jacksonville to install a motor bus line. Those in favor of a railway line were equally busy in trying to impress upon the people the advisability of the street car line, largely on the ground that it was more permanent in nature and that it would give better and more reliable service than a bus line. It was also pointed out that a railway would increase the value of real estate in that city and make it more desirable if a street car line were constructed than if a bus line were installed.

When the ballots were counted it was found that 147 people had voted for the street railway line, 113 for a bus line and 87 against either proposition.

The Council of South Jacksonville then took up with Stone & Webster, Inc., the matter of constructing the line for the city. An engineer representing Stone & Webster, Inc., is now on the ground and is making up estimates covering several routes. The Council of South Jacksonville will probably come to a decision as to the route to be selected at an early date. The present indications are also that Stone & Webster, Inc., will be awarded the contract for the construction of this line.

The town of South Jacksonville also has taken up with the receiver of the Jacksonville Traction Company the question of operation of the line in connection with the railway system in Jacksonville. An agreement will probably be reached, if and when approved by the court, under which Mr. Triay will take over the operation of the line for South Jacksonville and operate it in connection with the Jacksonville system.

Another Franchise Being Drawn for Saginaw

After a two-day session with Otto Schupp, grantee under the last street car-bus franchise that was defeated on April 2, the Council of Saginaw, Mich., has asked that a new franchise be written for Mr. Schupp to submit to the bondholders' protective committee of the bankrupt Saginaw-Bay City Railway at an early date.

The term of the grant is to be fifteen years, and the rate of fare, four tickets 25 cents; 10-cent cash fare; six tickets 25 cents or 5-cent cash fare for school children during school hours, and universal transfers.

The Council proposes that the rate of fare so fixed shall continue during the term of the franchise and that all disputes between the operating company and the City Council shall be settled by a board of arbitration composed of three, all Saginaw citizens. The Council is to name one member of this board, the company one and a federal judge the third.

This provision is designed to eliminate the need for appeal to the Michigan Public Utilities Commission to settle disputes, while with a fixed rate of fare to continue during the period of the franchise the necessity will be done away with of fixing a rate value. This has been considered a stumbling block to the people approving the franchises that were submitted in April and on Nov. 7 of last year.

There are some other changes in the grant proposed last month, but they are of minor importance.

The attorneys for the city and the grantee, when the conference had concluded on May 8, immediately set to work to rewrite the former franchise. It is expected this will be accomplished in a few days, when the new grant will no doubt be approved by the Council. Mr. Schupp will then be asked to submit it to those who will be asked to finance the project.

Men on Strike

Schenectady Employees Vote for Walk-Out—City Favors Strikers—Company Wants Open Shop

A strike of the operators of cars of the Schenectady Railway was started at midnight on May 16 when failure of the trolley company officials to meet the union representatives in arbitration with Mayor Whitmyer had resulted in an almost unanimous vote of the men to go out. The strike ties up not only the local city traffic but all urban service between Schenectady, Albany, Troy, Saratoga, Watervliet and Ballston Spa as well as service to the villages of Scotia and Woodlawn. About 600 men are out.

No cars are expected to be operated until a settlement is made unless the court should intervene, as just before the strike vote was taken John E. Cole, commissioner of public safety, told the men that in the event of a strike the cars would be kept in the carhouses. He ordered a guard of police stationed at each carhouse to see that the cars were not run out after they had been turned back on May 16. The balloting was a secret referendum but it was said the vote was almost unanimous.

CITY ADMINISTRATION WITH THE STRIKERS

President Frank X. Shay of the Common Council, following the strike vote, told the trolleymen he would aid them in every way by any possible legislation that could be passed by the Common Council. He was followed by Alderman Ray Madden, who said: "Go out and make a strong fight—a winning fight, and I wish you success." Commissioner Cole told the trolleymen to wage a clean fight "and not hit below the belt." He told them he believed they would win.

The strike issue was brought to a head by Harry B. Weatherwax, president of the company, who addressed the trolley men at a meeting of the employees on May 15, when he declared that the Schenectady Railway would operate on an open-shop plan from now on. This stand taken by Mr. Weatherwax after he had been requested by the Mayor to arbitrate brought about the crisis. The Mayor immediately made a last appeal to both sides to arbitrate, in which he was supported by the president of the Chamber of Commerce. Mr. Weatherwax was firm in his stand not to treat with the union officials, the only concession he would make being that he would put the matter up to the meeting of the board of directors who own the stock of the road, which meeting will take place early next week.

James Largay, international officer of the union, who is at present in charge of negotiations for the men, said that in his opinion the company was determined to break the union because of the existence of an old agreement, under which the company would be compelled to pay a 60 cent wage as long as it received a 7-cent fare on city lines. He referred to the agreement entered into several years ago by a former general manager of the company, with the Amalgamated Association, which was a triangular affair resulting from the demands of the men during the war for an increase which was granted through a waiver of the franchise rights by the Common Council. The Council did this so the company would be financially able to increase the wages from 45 to 60 cents. On Dec. 1 last the scale was reduced to 45 cents.

The strike promises to develop a most interesting situation. With the city of Schenectady assuming responsibility for transportation facilities and using its police powers to prevent the company from operating its cars unless it comes to an agreement with the trolleymen's union, and Mr. Weatherwax and Mr. Hamilton determined that they will not recede from the position they have taken, either the company will be forced into serious financial straits or the city of Schnectady will establish the feasibility of municipal regulation of transportation facilities, and with a municipal election to be held in November the administration is certain to bend every effort to do this one thing.

Interurban Increases Wages of Employees Other than Trainmen

Increases of from 3 to 5 cents an hour in the pay of all classes of labor employed by the Indiana, Columbus & Eastern Traction Company with the exception of transportation men were announced on May 11 by F. A. Healy, secretary-treasurer of the company. The increase is retroactive to May 1 and will be added to the pay made May 20. According to Mr. Healy, the increase will add $3,500 monthly to the payroll. Section men are increased from 30 to 35 cents an hour, bridge carpenters from 40 to 45 cents, bridge carpenters' helpers 35 to 40 cents. Other classes of employees get increases ranging from 3 to 5 cents an hour. The increase, Mr. Healy declared, is in line with the increases which have been made by the steam roads of the country.

Pennsylvania Information Committee Functioning

The Pennsylvania Public Service Information Committee started to function on May 15. P. H. Gadsden, vice-president of the United Gas Improvement Company and chairman of the committee, in announcing the purpose of the new organization, said:

> The purpose of the committee is primarily educational. In the last few years the rapid development of public interest in public utilities along practical lines has rendered this necessary. The committee is, in fact, a State bureau created to supply to the public, through the press and otherwise, accurate information concerning the public utilities of Pennsylvania, with a view of crystallizing sound public opinion and a feeling on the part of the public which will promote clear understanding of public utilities.

The executive committee is composed of P. H. Gadsden, chairman; W. C. Dunbar, Philadelphia Rapid Transit Company; W. H. Johnson, W. C. Hawley, C. L. S. Tingley and P. C. Stapler. Headquarters of the committee are 930 City Center Building, Board and Cherry Streets.

James M. Bennett, publicity manager United Gas Improvement Company, has been named secretary of the committee. Major J. S. Stewart Richardson has been appointed director.

Connecticut Men Present Demands

The Connecticut Company, New Haven, on May 14 received the demands of the trolleymen's union to be incorporated in a proposed new agreement when the present one expires on June 1. The request is for a maximum wage scale of 65 cents an hour, an increase of 13 cents. For operators of one-man cars the maximum is 80 cents an hour, an increase of 21 cents. The shopmen and mechanics ask for a 25 per cent increase.

News Notes

Platform Men Receive Increase.—The Buffalo & Lake Erie Traction Company, Buffalo, N. Y., operating between Buffalo and Erie, Pa., has granted a wage increase of 5 cents an hour to its platform employees. About 250 men are affected. The men had threatened to call a strike May 1, 1923, unless their demands for a wage increase had been granted. Operators of one-man cars will now receive 60 cents an hour and trainmen on cars requiring two men will receive a maximum of 55 cents an hour.

Interurban Men Get Increase.—Motormen and conductors employed by the Cleveland, Southwestern & Columbus Railway, Willoughby, Ohio, have voted to accept a wage increase of 5 cents an hour. The new scale provides an increase of 12 per cent over last year's wages. It is the equivalent in amount to that awarded the Cleveland Railway's platform men by a board of arbitration. The new wage scale for the interurban gives first-year men 46 cents an hour, second-year men 50 cents an hour and third-year ment 54 cents an hour.

Men Receive Wage Increase.—Three hundred employees including trainmen, of the York Railways will receive an increase in their wages amounting to 2½ cents an hour. Under the new schedule all who have been with the company six months will receive 42½ cents an hour plus a 10 per cent bonus, which equals 46.75 an hour. Those who have been with the company longer than six months, up to the second year, 43½ plus bonus, 47.85; second year, 44½ plus bonus, 48.95; third year, 45½ plus bonus, 50.05; fourth year, 47½ plus bonus, 52.25; fifth year, 48½ plus bonus, 53.35. The men work from nine and one-half to ten hours a day.

Financial and Corporate

Lake Shore Plans Announced

Ohio Interurban to Readjust Capital Structure and Arrange for Customer and Employee Ownership

Plans have just been announced for the reorganization of the finances of the Lake Shore Electric Railway, which operates 225 miles of interurban railway connecting Cleveland, Toledo, Detroit, Lorain and Sandusky. Under the refinancing arrangement $2,000,000 of 7 per cent prior preferred stock will be issued. The money derived from the sale of this stock will be used to retire maturing obligations, improve equipment and generally rejuvenate the road.

Involved in the refinancing plan, too, will be the retirement of $500,000 of authorized but unissued first preferred treasury stock. A million dollars of this first preferred stock is now out.

Articles of incorporation are to be amended and changed so that ultimately the authorized capital stock of the company will consist of $9,500,000 of stock of $100 par value. Of this capital, 20,000 shares are to be prior preference stock, 10,000 shares first preferred, 20,000 second preferred and 45,000 shares common stock.

At the present time the company has $1,000,000 of first preferred stock outstanding, $2,000,000 of second preferred, $4,500,000 of common stock and bonds totaling $5,750,000.

An effort is to be made by the company to secure wide distribution of the company's new stock in home markets, following the lead of other public utility companies in the scheme of customer ownership.

In a letter to the stockholders E. W. Moore, president of the company, says:

> Your officers and directors for some time have been convinced of the desirability of a change in the financial structure of the company so as to decrease the amount of its floating indebtedness and fixed charges. In studying the situation they have been impressed with the success of various public utilities in this and other States in arranging permanent financing through the sale of preferred stock to and through employees, to patrons and the public in territory served.

President Moore also refers briefly to the plan already outlined. He continues as follows:

> The experience of other public utilities in arranging this kind of permanent financing indicates, and your officers believe, that your company would receive the following benefits from the issue and sale of this stock:
>
> 1. From the wide distribution of this stock through the territory served the company would have a larger number of stockholders directly interested in its welfare.
> 2. The problem of refunding the company's bonds would be simplified by reason of the smaller amount of bonded indebtedness which, in turn, should enable the company to refund its bonds at a lower rate of interest, thus benefiting all stockholders of the company.
> 3. This plan would provide funds for capital expenditures heretofore provided for through the creation of floating debt and the use of the entire surplus earnings which in the past has prevented, in part at least, the distribution of any part of the earnings to stockholders.

The new plan was ratified by the stockholders at a meeting held at Cleveland on May 14.

Amicable Settlement Averts Receivership

Agreements have been reached to stipulate on certain points in the suit of the Emergency Fleet Corporation, to dispose of the debt standing against the city of Tacoma, Wash., in the case of the municipal car lines to the tideflats. Under the understanding, receivership of the municipal car line will be avoided and the special fleet debt fund will not be sought by the government, pending settlement. Under an agreement between the government representatives and the councilmen for the city the fleet corporation counsel will be allowed to make a physical inspection of the municipal line and equipment and go over the accounts of the city pertaining to the operation of the line. Counsel for the government recently secured a restraining order in the federal court preventing the city from disposing of any of its railway funds by transfer or otherwise, or in any way changing the conditions pending settlement.

Railway and Power Departments Segregated in Portsmouth

The Virginia Railway & Power Company has transferred its Portsmouth holdings to the Portsmouth Transit Company, Portsmouth, Va., which was organized and chartered recently, and which has just made a bid for the traction franchise of that city. Announcement to this effect was made by A. H. Herrmann, assistant to Thomas S. Wheelwright, president of both the new and the old company. The new company will be a subsidiary of the Virginia Railway & Power Company.

W. Jennings Crocker, Jr., counsel for the Virginia property in Portsmouth, is secretary of the new company. Among other incorporators is T. Norman Jones, general manager of the property in Norfolk.

Mr. Herrmann said the movement is one to segregate the railway property of the company from its light and power business. The new company will have nothing to do with the light and power departments of the Virginia Railway & Power Company in Portsmouth, but will buy its current from the concern. The new company is the only bidder on the new franchise offered for operation in Portsmouth by the City Council. Its bid was $5. Mr. Herrmann said the Virginia Railway & Power Company probably would take over the franchise in the course of time.

The new company will sell $750,000 of stock to the citizens of the community.

Seattle Municipal Gross Slightly Less

Operating Expenses Are Reduced by Greater Use of One-Man Cars—Revenue Accounts Shown

The Seattle Municipal Street Railway Department's annual report for 1922 was transmitted to the Mayor and City Council on March 28, by D. W. Henderson, general superintendent of railways. The figures are given in a form somewhat different from the usual corporation annual report. Total gross revenues for the year were $6,228,103, as compared with $6,347,175 in 1921; and total operating expenses, including depreciation and amortization, were $4,631,508. The 1922 report does not give the comparison of these expenses with 1921, but in the 1921 report they are shown as $5,105,487. The accompanying table, "Statistical Report of Operation," shows the detail of revenue and expense accounts. In the operating revenues are included a debit item of discounts and adjustments totaling $55,253, and in the miscellaneous revenues are included operating expenses of shops, service equipment, and utility equipment, totaling $41,984.

The resultant net revenue, $1,596,594, is not shown in the statement. The fixed charges along with operating expenses and separate income are shown in an "income, profit and loss statement." The deductions from gross income, shown in that statement, are:

Interest on general bonds outstanding		$35,750
Interest on revenue bonds outstanding:		
Total accrued	$800,217	
Less interest charged to construction	11,750	788,467
Miscellaneous interest		4,408
Amortization of discount on funded debt		6,908
Total deductions		$835,533

This leaves the net operating income for the year $761,062.

The net income was augmented as shown in the accompanying table of "Profit and Loss."

PROFIT AND LOSS		
Net income		$761,062
Gains accrued (other than income), current annual period		5,843
Delayed gains accrued in prior periods		22,140
Unearned increase of surplus—auto bus donated		3,227
		$792,272
Losses accrued (other than income), current annual period	$283	
Delayed losses accured in prior periods	81,905	82,188
Net income, profit and loss (gain), 1922		$710,084

The condition of the property is shown in the balance sheet. Capital assets, including plant and equipment, special construction, and cash on hand available for capital outlay, totaled $15,072,693. Against this, funded ob-

ligations and accounts payable are outstanding to the amount of $16,716,384. The total assets fail to equal the total liabilities, there being a deficit up to the end of 1922 amounting to $877,491.

The system spent $1,048,687 for plant additions and betterments during the year, of which $427,832 was for the rebuilding of cars and motive equipment, and $471,861 for undistributed construction of plant and work in progress. Against this the plant retired from service was $518,413, leaving the net additions during the year $530,274.

STATISTICAL REPORT OF OPERATION, SEATTLE MUNICIPAL STREET RAILWAY.

Revenues	Amount	Cents per Car-Mile	Cents per Car-Hour
Passenger car revenue...	$6,130,729	39.64	366.19
Other operating revenue.	85,840	0.56	5.13
Total operating revenue.	$6,216,569	40.20	371.32
Miscellaneous revenues and expenses.....	11,533	.07	.68
Total gross revenues....	$6,228,102	40.27	372.00
Operating Expenses			
Way and structures....	$382,805	2.48	22.86
Conducting transportation.....	2,040,453	13.19	121.88
Maintenance of transportation equipment..	382.607	2.47	22:85
Housing and hostling equipment.....	186,956	1.21	11.17
Power.....	613,677	3.97	36.65
Commercial.....	49,725	.32	2.97
General.....	290,171	1.88	17.33
Depreciation and amortization.....	685,114	4.43	40.93
Total operating expenses	$4,631,508	29.95	276.64

CONDENSED BALANCE SHEET OF SEATTLE MUNICIPAL RAILWAY AS OF DEC. 31, 1922

ASSETS		
Capital assets:		
Lands.....	$423,894	
Plant and equipment, $16,067,323, less accrued depreciation, $2,443,094	13,624,229	
Cost of "Greenwood" line acquired in 1922.....	55,410	
		$14,103,533
Special construction.....		593,263
Cost available for capital outlay only (bond funds cash).....		375,897
Total capital assets.....		$15,072,693
Total redemption and special fund assets.		1,101,218
Total current assets.....		649,343
Deferred charges.....		85,522
Deficit, Dec. 31, 1922.....		877,491
		$17,786,267
LIABILITIES		
Capital liabilities:		
Bonds outstanding.....	$16,652,000	
Bond fund loan payable to railway operating fund.....	542	
Accounts payable.....	63,842	
Total capital liabilities.....		$16,716,384
Redemption and special fund liabilities:		
Accrued interest on funded debt.....	$274,774	
Matured unpaid bonds, principal..	250	
Depreciation fund reserves.....	33,294	
Total redemption and special fund liabilities.....		$308,318
Current liabilities:		
Amounts payable to general, light, and railway bond redemption funds.	$445,884	
Accounts payable, tokens and approved claims...	282,604	
Warrants outstanding...	33,075	
Total current liabilities.....		761,565
		$17,786,267

CLASSIFICATION OF PASSENGER CAR-HOURS AND CAR-MILES IN SEATTLE FOR 1922

	Car-Hours	Car-Miles
One-man single truck.....	168,307	1,291,260
One-man double truck.....	296,856	2,704,945
Two-man...	1,161,343	11,107,158
Buses.....	28,463	258,822
	1,654,969	15,362,185

The authorized bonds of the company totaled $16,730,000, of which there were outstanding $15,877,250. Interest accrued on these bonds during the year amounted to $800,217.

The system carried a total of 96,406,775 passengers, of whom 598,828 rode on the three bus lines operated by the railway. The car-miles and car-hours operated to handle this business are shown in an accompanying table.

"In connection with the data furnished," says the report, "the following comments will be of some value:"

The number of trainmen has been reduced due to the increased number of one man cars in use. Schedule hours have been increased. Schedule speed has been reduced, fully explained by the fact that First Avenue traffic was for the greater part of the year diverted over other streets, making undue congestion.

Our maintenance department has made numerous and extensive repairs. The general condition of roadway and tracks has been much improved.

Aside from general repairs, during the year the shops have converted forty-five two-man cars into one-man cars.

In general, with the nearing of completion of paving on First Avenue from Pine to Atlantic Streets; the better condition of tracks and equipment; the success of the one-man car of the larger type, and the fact that we are prepared to extend their use, we face the coming year in a better condition economically to serve the public than in any year under municipal ownership.

During the year the company has had 3,989 railway accidents, which was an increase of seventeen over the previous year. There were also 1,626 non-railway accidents, a decrease of 107 from the previous year. The principal cause of accidents was collisions with vehicles, which totaled 2,634. The amount of injuries and damages during 1922 was $37,368, corresponding to 0.24 cents per car-mile, or 0.6 per cent of the gross revenues.

The company has a total of 1,880 employees, of whom 1,216 are trainmen. There are thirty-nine other employees in transportation work, forty-two in accounting—including storekeepers and cashiers—and 583 in maintenance of way, construction, and equipment.

An uncommon feature in the labor situation is that all the employees are given vacations with pay. The extent of this is shown in the following table:

PAYROLLS AND VACATIONS—1922

	Payroll	Cost of Vacations
Train roll.....	$2,127,457	$95,134
Shop and carhouses.....	485,366	16,043
Way and structures.....	324,172	24,347
Accounting department....	80,605	3,295
	$3,017,600	$138,819

Additional Common Stock to Be Offered

The United Light & Railways Company, Grand Rapids, Mich., has announced that all first preferred and participating preferred stockholders of the company, of record at the close of business May 25 will be permitted to subscribe at par, to an amount of common stock equal to 5 per cent of their holdings. All common stockholders of record May 25, will be permitted to subscribe, at par, to an amount of common stock equal to 10 per cent of their holdings. This will bring the total of the common stock up to $4,500,000.

Treasury Rules on Profits of Subsidiaries

The Treasury Department in a decision made public on May 11 by Commissioner Blair of the Internal Revenue Bureau has declared certain kinds of corporation dividends exempt from taxation as income. The refunds will come from claims filed under amendment to the tax regulations covering distributions out of earnings or profits by holding corporations accumulated prior to March 1, 1913.

The ruling reverses the previous practice of the bureau, which has held that profits or earnings turned in by a corporation to its holding or parent corporation lost their identity, and therefore when distributed as dividends were taxable as income.

Now, however, the bureau will trace the funds created by the subsidiary company through the holding corporation finally to the stockholder, who, the decision holds, need not pay tax on it. Limitation is made, however, on the distribution of such earnings by the ruling, which adds to the previous regulation the following language:

Whenever one corporation has received from another corporation distributions out of earnings or profits accumulated by such other corporations prior to March 1, 1913, or out of increase in value of its property accrued prior to March 1, 1913, and the receiving corporation, after having first distributed all of its earnings and profits accumulated since Feb. 28, 1913, distributes to its stockholders the amount so received by it from such other corporation, such distributions are not dividends within the meaning of the Revenue Act and are exempt from tax.

Brooklyn Subsidiaries to Be Reorganized

The reorganization committee of the Brooklyn Rapid Transit Company, headed by Albert H. Wiggin, has promulgated a plan for the reorganization of the New York Consolidated Railroad and New York Municipal Railway Corporation, and for adjustment of the respective interests therein of bondholders, creditors and stockholders of these companies. The plan contains an offer to acquire all or part of the preferred and common stocks of the New York Consolidated Railroad outstanding and to issue in exchange preferred and common stock of the reorganized Brooklyn Rapid Transit Company.

The New York Consolidated stockholders participating in the reorganization will receive for each share of preferred stock deposited one-half share of new 6 per cent preferred stock and one-half share of new common, and for each share of common deposited two-fifths share of the new 6 per cent preferred and three-fifths share of new common.

By exercising an alternative option for participating in the reorganization, holders of preferred and common stock of the New York Consolidated will be entitled to exchange holdings for a proportionate amount of stock of the new rapid transit subsidiary proposed to be organized as provided in the Brooklyn Rapid Transit reorganization plan, upon payment of $100 for each share of pre-

ferred and $105 for each share of common. In return for payments, stockholders will be entitled to receive an equal principal amount of rapid transit refunding mortgage 5 per cent bonds of the new rapid transit subsidiary proposed to be formed.

Stockholders electing the second option will receive for each share of preferred stock $100 rapid transit refunding mortgage 5 per cent bonds and one share of capital stock of the new rapid transit subsidiary; for each share of common stock $105 rapid transit refunding mortgage 5 per cent bonds and one share of capital stock of the new rapid transit subsidiary.

The new rapid transit company contemplated under the Brooklyn Rapid Transit reorganization plan will be vested with the rights and obligations existing under contract No. 4, including leasehold interest in city-owned lines, as well as with title to company-owned elevated lines and other properties now embraced in the rapid transit system. The new rapid transit refunding mortgage 5 per cent bonds will be an obligation of this subsidiary.

The properties of the Consolidated company and of the Municipal Railway have been in the hands of Lindley M. Garrison as receiver since Dec. 31, 1918. He has sold $18,000,000 of receiver's certificates, the proceeds of which have been expended for construction purposes under rapid transit contract No. 4. Suit has been brought to foreclose the first mortgage of the Municipal company and the mortgage securing obligations of the Consolidated company.

The New York Consolidated Railroad owns the elevated lines in Brooklyn, which are operated in conjunction with certain rapid transit elevated and subway lines built with money advanced by the city of New York. It also owns all of the $200,000 of issued and outstanding capital stock of the New York Municipal Railway, which by contract No. 4, dated March 19, 1913, with the city agreed to contribute certain funds toward the construction of certain subway and elevated lines to be built and owned by the city, to equip those lines, to reconstruct and extend the then existing "L" lines owned by the Consolidated company and to operate as a single system all of the "L" lines and the new subway and "L" lines to be constructed. The contracts of the Municipal company with the city were subsequently assumed by the New York Consolidated Railroad.

P.R.T. Valuation Hearing Ends

The taking of testimony in the property valuation proceedings of the Philadelphia Rapid Transit Company, which has been before the Public Service Commission for nearly three years, was concluded before Commissioner Clement on May 15. The commissioner announced that he had arranged to hear the arguments before the entire commission on June 7. In the meantime the city and the P.R.T. Company will file briefs with the commission.

Detroit Mayor Claims Profit in First Year's Operation

With the completion of one year of unified operation by the Department of Street Railways on May 14, Mayor Doremus of Detroit issued a statement to the effect that the Detroit Municipal Railway is paying its way from earnings and improving service as well. The Mayor pointed out the following results for the first year of unified operation: Gross income, $19,000,000; net income, $1,000,000; total number of passengers carried, 475,000,000; average daily number of passengers, 1,500,000; trackage, 373 miles; number of cars, 1,600; cars maintained in daily schedule, 1,425; amount set aside from income to pay interest in sinking fund charges, $4,000,000; taxes paid, approximately $500,000; number of D.S.R. employees, 6,000.

During the past year there has been paid from earnings the sum of $1,200,000 on the contract under which the lines were taken over from the private company. Of this amount, $500,000 represents a payment that is not due until June 1, and $200,000 an advance payment on the installment due December 1.

During the past year a comprehensive program was adopted to rehabilitate the tracks and equipment taken over from the former owner, and this program has been financed from earnings of the system. Owing to the condition of the tracks at the time of purchase, it will require several years to complete this program.

The foregoing results have been accomplished after paying from earnings $456,796.83 for taxes and setting aside 3 per cent of the gross revenue from operations with which to pay damage claims and judgments resulting from personal injuries, according to the Mayor.

The last available statement of earnings under date of March 31 shows that the Department of Street Railways, since May 15, 1922, after meeting the total operating expenses, taxes and all fixed charges, had made a net profit of $948,023, a monthly average of $90,000. So it may be assumed, the Mayor states, that in the year closing May 14 the department's net profits will have exceeded $1,000,000.

These earnings have been transferred to the surplus account. In order to correct an impression that may exist that this surplus represents actual cash, it was pointed out that while the amount is carried as surplus, it represents, to a large extent, expenditures from earnings for additions and betterments of an extraordinary nature. Instead of leaving the money in the treasury it has been expended in rehabilitating the system.

Some of the major items into which the surplus has been converted are: The building of trailers, the construction of a large paint shop, the purchase of additional automobile trucks, the building of additional track layouts, the purchase of machinery, tools and equipment, the payment of a five-year insurance policy and the prepayment of taxes.

Auction Sales in New York.—At the public auction rooms in New York there were no sales of electric railway securities this week.

Sale of Branch Line Approved. — Federal Judge Killits of Toledo, on April 27, approved the sale of the Lima-Defiance branch of the Indiana, Columbus & Eastern Traction Company to Joseph A. Murray for $25,000.

Commission Approves Boston "L" Issue.—The Department of Public Utilities of Massachusetts has approved the issue by the Boston Elevated Railway of not more than $2,300,000 of thirty-year 6 per cent negotiable registered or coupon bonds.

New Director for New York — Harlem Railroad.—Bertram Cutler has been elected a director of the New York & Harlem Railroad, New York, N. Y., to fill the vacancy caused by the death of William Rockefeller. The other directors have been re-elected.

Offer to Purchase Line.—Following a proposal by the Brunswick Traction Company, Brunswick, Ga., to sell its property to the city for $22,283, the city commissioners have submitted their price of $12,000. Authority will be asked of the Legislature shortly for the city to own and operate the railway.

Seeks Issue to Rebuild.—The Lima Street Railway has petitioned the Ohio Utilities Commission for permission to issue $100,000 in common stock to rebuild the lines. If the issue is approved the outstanding stock of the company will be $965,000. D. J. Cable, attorney; Congressman John L. Cable and others bought the property of Thomas Newhall, Philadelphia, for $730,000 and stock totaling $135,000 was issued for the purchase of twenty one-man cars.

Shawinigan Said to Be After Quebec Lines.—Interests identified with the Shawinigan Water & Power Company are said to be considering acquisition of control of the company. If the plans mature, says the *Financial Post*, Toronto, Shawinigan will provide the funds to meet the $2,500,000 of bonds that mature on June 1. This may be done by the purchase of an equivalent amount of the 5 per cent consolidated bonds by the new interests and the creation of an additional loan to the company to cover the difference between market value and par. Or it may be done by short-term financing looking to permanent funding of the bonds later when Shawinigan finally sits in the saddle and can show a record of successful operation. The *Post* says that if the Shawinigan deal falls through it is quite likely the directors will fall back on the former plan of financing the refunding operations by short term notes. The latest move in connection with this matter is the announcement of the election of Julian C. Smith to succeed President Robert with the Quebec Company.

Traffic and Transportation

Council Firm for Ten Cents

Seattle Body Wants Former Cash Fare Restored—Members Prepared to Pass Measure Over Veto

At a recent joint meeting of the city utilities committee and the entire City Council of Seattle, Wash., enough votes were indicated to insure passage of the proposed ordinance to increase fares on the Seattle Municipal Railway over Mayor E. J. Brown's veto. As amended, the present ordinance provides for restoration of fare to a straight 10-cent cash rate with three tickets for 25 cents. This was the rate in effect before the 5-cent fare was introduced on March 1.

Six votes are required to pass the measure over Mayor Brown's veto, and these votes have been pledged. The rates named in the ordinance were suggested to the City Council by Superintendent of Utilities Russell several weeks ago. Recently Mr. Russell sent the Council a report showing that even if the issue of railway purchase bonds was extended to forty years, at rates of interest varying from 4 to 5 per cent, discussed in connection with pending negotiations, the fare would have to be raised to more than 7 cents in order to take care of all charges.

Mayor E. J. Brown has appointed a committee to negotiate with A. W. Leonard, representing the Stone & Webster interests. The committee includes Mayor Brown, President C. B. Fitzgerald of the City Council and E. L. Blaine, chairman of the finance committee. The city intends to propose to the trustee suggestions for the extension of the maturity of the bonds given by the city in payment for the road. The idea is to extend the contract to forty years from the original date of issue, with equal annual payments. Mayor Brown does not favor Mr. Leonard's suggestion that the committee be sent to Boston, but believes negotiations should be carried on in Seattle. The bonds are now written for twenty years, of which four have elapsed. The forty-year proposal would enable the city to cut down its annual payments on principal and interest to a total of approximately $650,000.

Fight On in Buffalo Over Fare Increase

Dr. Milo R. Maltbie has been engaged by the municipal authorities of Buffalo to assist the city in its fight against the attempt of the International Railway to raise its fares from 7 cents or four tokens for 25 cents to 8 cents or four tokens for 30 cents.

Frederick C. Rupp, deputy corporation counsel, has been detailed by the city to handle the legal phase of the fight. He says there is no justification for the attempt of the railway to increase the fare at this time. He regards the move of the company as an attempt to recoup itself for losses in the strike.

Herbert G. Tulley, president of the International, explains that the application is made because the receipts are insufficient to pay the actual cost of operating the local lines. For the three months ended March 31, 1923, the deficit for the system, he says, was $193,219. Over and above operating expenses the company must pay bond interest, which amounts to $387,222. The total deficit, therefore, of the company for the first three months of the current year is $580,441. The amount of this deficit attributable to operations within the city of Buffalo, Mr. Tulley says, is $319,855.

City Agrees to Fare Extension

The Kansas City Railways filed an application with the Public Service Commission of Missouri on May 5 for authority to continue charging the public the same schedule of fares it now is exacting and extending the time for one year from May 18, 1923.

John B. Pew, Kansas City city counselor, wrote to the receivers, as follows:

I do not feel that I could sincerely resist an application on the part of the receivers for a continuation of these fares at this time. I do desire to suggest, however, that if your body, after examining the evidence, feels that these fares should remain as at present, an order be made continuing them indefinitely, or if for a fixed time, that it be not longer than six months.

Mr. Pew says he believes the road is being operated as economically as possible.

A section of the application shows that for all of last year a deficit above the earnings occurred to the extent of $418,504, and that for January, February and March this year, the deficit was $86,165.

The fare in Kansas City is 8 cents.

Houston Jitneys to Be Rerouted

City Council Decides Autos Must Be Removed from Streets that Have Car Lines—Jitney Men to Submit Plans to Meet New Requirements—Hope Ahead for Railway

After considering both sides of the question the City Council of Houston, Tex., on May 4, voted to reroute the jitneys to streets not occupied by the railway lines. Both the Houston Electric Company and the jitney men were requested to submit a rerouting plan, and from these plans the Public Service Commissioner will definitely establish the new routes. This will eliminate direct competition between street cars and jitneys and is expected to help solve the transportation problem in Houston.

The jitney matter came up again for consideration as a result of the appeal of the Houston Electric Company for relief. It will be recalled that the company recently negotiated an extension of its franchise calling upon it to spend $1,200,000 for rehabilitation and improvements. The jitneys had long been more or less of a menace to the company, but with the beginning of this program their operation became a source of greater annoyance than ever to the company. After construction work was well under way, the Houston Electric Company asked the City Council to reduce the number of jitneys. At that time 191 jitneys were running. By way of a compromise the city agreed to reduce the number to 150. This was done on Jan. 1, 1923. The results of the operation of the company for 1923 are not as promising as were expected and it was necessary to ask further relief of the City Council. Accordingly on April 27 the company submitted a letter to the City Council in which it pointed out, among other things, that since the company commenced the work under the franchise extension, its financial condition had gradually grown worse instead of better and that it had suffered enormous losses during this period, as shown in the following financial statement:

REPORT OF HOUSTON ELECTRIC COMPANY

Result of operation under franchise extension ordinance and four tokens for 25 cents for year ended March 31, 1923

Gross earnings		$2,021,929
Operating expenses	$1,530,074	
Depreciation	296,957	
Taxes	148,450	
Total		1,975,481
Balance		$46,448

As the company pointed out it was barely earning operating expenses, depreciation and taxes; in fact, the balance of $46,488 earned during this twelve months' period would pay a fair return on less than $590,000 of value.

Stated another way, the return earned during these twelve months was insufficient to pay a fair return on even one-half of the amount of actual cash which the company had expended since the franchise extension ordinance was passed. This statement, said the company, challenged the fairness of every right-thinking man. The responsibility for this condition of affairs was charged to jitney competition and insufficient fares. It said that jitney competition had, in fact, reached a point where either the jitneys must go or the company must fail utterly to function as a transportation system. Against the jitneys these counts were brought:

Jitneys are permitted to operate on the same streets with street cars, thereby furnishing a duplication of service.

Jitneys are permitted to operate within the short-haul radius only. They play no useful part in the upbuilding of a city, nor do they serve outlying territory.

Throughout the city the company has

paid for and maintains approximately 200,000 sq.yd. of paving at a total cost to the company, including bridges and tunnels, of more than $1,100,000, an amount that would have been assessed against property owners and had been saved to them through payment by the company.

Jitneys use this investment to take away from the company the short haul, which is the most profitable part of our business.

Jitneys do not contribute to the upkeep of the streets, but instead are permitted to wear out an investment made by the property owners and by the company.

Jitneys make the operation of street cars more hazardous and add enormously to the already and fast-increasing traffic congestion of our streets.

Jitneys operate as best suits their convenience.

As a first step toward a settlement of the problem the company suggested:

1. That jitney competition be abolished, or;

2. That transportation in the city be divided between jitneys and street cars; the jitneys to furnish transportation to any one entire section of the city, withdrawing street car service therefrom, and the street cars to furnish transportation to the entire other section of the city, withdrawing jitneys therefrom.

JITNEY HISTORY REVIEWED

The City Council asked for time to consider this letter and at the same time give the jitney men an opportunity to present their side of the story. This the jitney men did in a communication addressed on April 30 to the Mayor by R. R. Tripp, recording secretary of Auto Bus Drivers' Union No. 243. The jitney men said that after carefully considering the company's statement and after making an investigation of the existing franchises and city ordinances, they could find no grounds for granting the company's appeal for the elimination of the jitneys. They said that the auto bus drivers were not complaining about the existing conditions and had conceded various reductions without protest, but felt they could not concede any further curtailment.

To this the Council replied, as indicated previously, by voting to reroute the jitneys to streets other than those occupied by the railway.

On its historical side the jitney as a menace to the company dates back to 1914. The first jitney began operation in Houston on Nov. 28 that year. By Dec. 25 there were 625 in operation and in the early part of 1915 there were approximately 900. To combat the jitney service the railway greatly increased service on all lines. However, the people rode in the jitneys in preference to street cars. As a result it became necessary to curtail railway service.

Early in 1916 the City Council passed an ordinance regulating jitneys and fixing the license fee at $36 a year and requiring a bond of $2,500. The cost of the bond was from $125 to $150 a year. The jitney men initiated an ordinance granting jitneys a blanket franchise on all of the streets without license. This was voted down by the people because it completely turned the streets over to the jitneys.

The war-time demand for men practically stopped jitney operation. At one time in 1918 only six jitneys were running, all to Camp Logan, where 30,000 soldiers were stationed. During the general depression of 1920, with many unemployed, the number of jitneys increased so that at the end of the year there were 170 in service.

During the fall of 1922 the company endeavored to obtain the passage of an ordinance extending the present franchise fifteen years and obligating the company to spend $3,000,000 for improvements, $1,000,000 of which was to be spent within sixteen months after the passage of the ordinance and specified that the company be permitted to earn 8 per cent on its property value.

This ordinance was submitted to the people and defeated by a vote of three to one.

Undaunted by this failure the company submitted a proposition asking for a sixteen-year extension to the franchise which expires in 1935, agreeing to spend $1,200,000 for extensions and improvements, within two years from the passage of the ordinance. It further specified that no money could be spent as a part of the $1,200,000 without approval of the City Council. This franchise extension did not state the rate of return allowed on property value.

The City Council passed this franchise in the form of an ordinance on Jan. 20, 1922, and at the same time passed an ordinance requiring the Houston Electric Company to sell tokens at the rate of four for 25 cents, the cash fare remaining 7 cents with universal transfer.

No serious difficulty was experienced in selling these notes, due to the general understanding that the financial condition of the company would be gradually restored to a sound basis through wise and fair regulation by the City Council.

Another Railway Uses Buses in Supplementary Service

The Youngstown & Suburban Railway, Youngstown, Ohio, has begun operation of a bus line between Youngstown and Salem along a route which in general parallels the company's own tracks. The bus line, however, serves several localities more or less remote from the railway. It is felt that the transportation needs of these places justify the establishment of the new service. In fact, wildcat jitneys were already attempting to give service before the railway commenced operation.

Four de luxe buses are used in the new service. They operate between Salem and Youngstown on a two-hour headway during a greater part of the day. The railway gives hourly service to Salem and the bus schedule is arranged to split every second trolley headway. In the evening, the buses do not operate through to Youngstown, but meet cars at Columbiana and carry passengers from that place to East Palestine. The jitneys formerly provided the service between these two points, unloading their passengers at Columbiana for transfer to the railway. When the jitneys commenced to run through to Youngstown the railway took up the matter of bus operation.

Improvement Program at Los Angeles Approved

Following the defeat at a public election in Los Angeles, Calif., on May 1 of two proposals for operation of buses in competition with the electric railways, the plans for extensive improvement of Los Angeles transportation facilities were officially approved on May 7 by the Los Angeles Board of Public Utilities, by granting permits for the operation of buses in connection with the electric cars.

The service improvement program includes construction of new track extensions by the Los Angeles Railway, the operation of buses by the Los Angeles Railway and the operation of joint buses by the Pacific Electric and the Los Angeles Railway under the name of the Los Angeles Motorbus Company.

Operation of One-Man Cars Will Continue in Lansing

As the result of a recent Federal court hearing in Detroit Receiver John F. Collins of the Michigan United Railway will continue the operation of one-man cars on all lines in Lansing. At the hearing Judge Tuttle was presented with a protest against the one-man cars which was adopted by the City Council.

Two months ago the receiver went into court at Detroit with a petition to substitute one-man cars in Lansing which was allowed by the judge, who set a sixty-day test period for the operation of one-man cars. The union was represented at the hearing.

When the trial period was up the court ruled that the dangers of the plan had been exaggerated and gave his consent to the one-man operation for an indefinite time.

Restricts One-Man Cars in District of Columbia

Capt. R. G. Klotz, traffic engineer, as the result of his study of one-man car operation in a dozen American cities, made a recommendation to the Public Utilities Commission that the use and development of this type of car in the District of Columbia for the time being be restricted to the lines on which they are now in operation and that these present lines be fully equipped for one-man operation as an experiment. Captain Klotz submitted with his report a description of the types of one-man cars and how they are operated in New York, Rochester, Detroit, Chicago and Cincinnati. In his report he said:

The opinion of those operating the greater number of such cars is that they should not be placed in use until there are sufficient available to operate an entire line and that their installation should be accompanied by some reduction in the headway. I am inclined to believe that lack of acquaintance with these two pointers or failure to observe them, has had considerable to do with the hostility toward such cars that has been apparent here, as our local cars are undoubtedly equal in type and quality to the best to be found elsewhere and very much superior to the general run of such equipment.

Some weeks ago the commission held

a public hearing on the one-man car argument. The report of Captain Klotz was awaited before a decision was handed down, which is expected in the near future.

Traffic Report at New Orleans Believed to Satisfy Railway

Paul H. Maloney, city commissioner of public utilities at New Orleans, said on May 4 that while the officials of the New Orleans Public Service, Inc., had made no formal announcement in regard to the Beeler report on traffic, they virtually had agreed upon complying with all the recommendations of the report except for a few minor details, which it is expected will be adjusted.

Officials of the New Orleans Public Service, Inc., have already agreed to start work at once toward the widening of St. Claude Street for the construction of the necessary tracks and neutral ground. The proposed Tulane-St. Claude line is the key of the entire Beeler reorganization of the traction system.

Mr. Maloney says that since the publication of the Beeler report, which foretold the widening of St. Claude Street, property owners have jumped the price of their properties to an unreasonable height. Commissioner Murphy is known to object to the city and company facing the heavy expense involved, because of the sudden jump in realty prices along the proposed route. He favors the adoption of another route or resort by the city to court action for the expropriation of the necessary ground under the city's right of eminent domain.

Completion of the new St. Claude-Tulane line as proposed in the Beeler survey will give New Orleans its first complete cross-town line, running from Carrollton Avenue to the sugar refinery at Arabi, in St. Bernard parish. It will do away with the present Tulane belt system.

Completion of the St. Claude-Tulane line, according to Mr. Maloney, will pave the way for other changes and will give the street car company the right-of-way to go ahead with its first cross-city lines from the river to Lake Pontchartrain.

Pass in Effect.—The Seattle & Rainier Valley Railway, Seattle, put into effect on May 7 the wholesale weekly pass. The rate is $1.15. Passes are on sale by all conductors of the line and at company offices.

Bus Experiment at Emporia.—The City Commission of Emporia, Kan., has granted the Kansas Electric Power Company, which operates the local electric railway system, permission to discontinue railway service for six months and to substitute eight buses as an experiment.

I. C. C. Postpones Date of Coupon Book Sale.—The Interstate Commerce Commission has postponed until Jan. 1, 1924, the effective date of its order requiring railroads to issue 2,500-mile interchangeable coupon books at a reduction of 20 per cent from the standard rate of fare. In the meantime it is expected a permanent injunction, granted by the Federal District Court at Boston against enforcement of the order, will be appealed to the Supreme Court.

Bus Rights Granted in Rochester.—The Council of Rochester, N. Y., at a meeting on May 8 granted the New York State Railways, through a subsidiary corporation, the Rochester Coordinated Bus Lines, Inc., a franchise to operate buses on Dewey Avenue, as an adjunct to the railway service of the company. It is expected that the line will start operations about June 1, when the crosstown trackless trolley line will also be instituted.

Buses for Auxiliary Service in Trenton.—The Central Transportation Company, with offices at 137 East State Street, Trenton, N. J., has been incorporated by Rankin Johnson, president of the Trenton & Mercer County Traction Corporation; Edward J. Peartree, general superintendent of the company, and Richard Stockton, a director of the corporation. The railway plans to augment its trolley service in Trenton and suburbs with buses. It is proposed to issue transfers from the buses to the trolley and vice versa for 1 cent.

Ten Cents Charged on Milwaukee Buses.—The buses used in the de luxe service started in Milwaukee, Wis., on May 2 by the Wisconsin Motor Bus Lines, a subsidiary of the Milwaukee Electric Railway & Light Company, are being operated entirely independent of the railway, and there is no exchange of transfers or tickets between the two. The bus fare is 10 cents and as far as possible loading is limited to the seating capacity. The starting of this service was referred to briefly in the ELECTRIC RAILWAY JOURNAL for May 12, page 824.

Approve Railless Cars.—Members of the City Council of Philadelphia and officials of the Philadelphia Rapid Transit Company recently visited the works of the J. G. Brill Company to inspect the new trackless trolley which the traction company is planning to operate on Oregon Avenue. W. C. Dunbar, president of the Philadelphia Rapid Transit Company, said that Oregon Avenue was the only route on which the company had definitely decided to operate the new cars. The rate of fare on the trackless trolleys will be the same as on the regular lines.

Annual "Dress-Up Day" in Green Bay.—Sunday, April 15, was "Dress-Up Day" for conductors and motormen of the Wisconsin Public Service Corporation, Green Bay, Wis. Conductors and motormen of all city and interurban cars were groomed in their best. "Dress-Up Day" is an annual custom adhered to by the company as a part of the campaign of trainmen to reduce accidents. Photographs were taken of the crews in two relays, and bonuses earned during the first quarter of the year for freedom from accidents were distributed to employees meriting such awards.

New Fare Tariff Filed.—The Puget Sound Power & Light Company has reported to the City Council of Bellingham, Wash., that it has filed with the Public Works at Olympia a new experimental tariff of four tickets for 25 cents, or a cash fare of 7 cents. The report declared that the present tariff of twenty tokens for $1, or a cash fare of 7 cents, had caused a loss during nineteen weeks of $10,018, compared with the revenue during the 6¾-cent fare in effect during the corresponding period last year. The revenues decreased from $77,638 to $67,620, although the passengers carried increased 6.9 per cent.

More Bus Lines for San Diego.—Claus Spreckels, general manager of the San Diego Electric Railway, San Diego, Calif., has applied to the State Railroad Commission to abandon certain of the company's railway lines and replace them with motor coach service. It is proposed soon to start motor coach service over 17½ miles of streets. The new service involves the abandonment of approximately 8.64 miles of railway including the line to Old Town and portions of the Point Loma line. In order to carry out the plan, additional motor coaches will have to be purchased, but the number required has not yet been determined. The new coaches will be similar in design to those now owned.

Barring One-Man Cars Opposed in Wisconsin.—A unified front was presented by the electric railways in Wisconsin operating one-man cars at the hearing before the corporation committee of the Senate. They attended in opposition to the proposal asking that one-man cars be barred in Milwaukee. The resident engineer of the Railroad Commission at Milwaukee and representatives of the commission in Madison appeared in opposition to the bill along with representatives of the railways. They declared that there are two things to take into consideration in the operation of one-man cars—safety and service, which have been fully exemplified by the one-man cars now in use in different parts of Wisconsin.

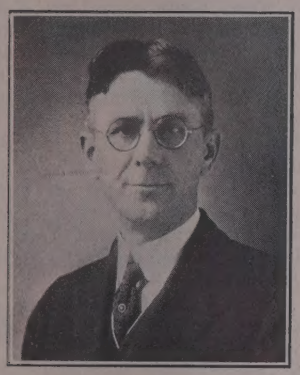
Favorable Results Expected.—After watching the results of the operation of the arterial highway ordinance for a week in Green Bay, Wis., Charles E. Warwick, superintendent of the railway department of the Wisconsin Public Service Corporation, stated that the setting aside of arterial highway zones in cities where cars operate will reduce accidents involving street cars and automobiles by 50 per cent on the street where such a safety measure is placed in force. With the streets crowded with new cars and new drivers, the trainmen of the company have staged a special defense against accidents in an effort to keep the number down during this period. Their efforts, coupled with the working of the ordinance, promise favorable results, it is said. In April the number of accidents was less than for any month for more than a year.

Personal Items

A. D. McWhorter Advanced

Engineer Long Connected with Memphis Street Railway Is Made General Superintendent

A. D. McWhorter, recently appointed general superintendent of the Memphis Street Railway, Memphis, Tenn., in charge of transportation, mechanical and overhead line departments, entered electric railway work in Atlanta in 1894 as a conductor with the Atlanta Traction Company. He served in that capacity for about six months. The industry was then just beginning to find itself electrically and mechanically, and an opening being offered in the shops Mr. McWhorter jumped at the chance to have an opportunity to become a factor in the work of "making the wheels go round." His first job in the mechanical department was in maintenance and inspection work as a member of the night force. He served there for two years and was then made night foreman. This position he held for two and a half years.



A. D. McWhorter

Just about this time the Atlanta Traction Company and the Atlanta Consolidated Street Railway were consolidated and Mr. McWhorter was appointed general foreman of the Glenn Street shops, in which capacity he served for a year. He was next transferred to the Fulton County shop, the main shop, and placed in charge of the motor and truck departments. Two years later he was made assistant master mechanic with direct supervision over all carhouses. He served in this capacity for three years, but in March, 1905, resigned to accept the position of master mechanic of the Memphis Street Railway. On Jan. 1, 1916, Mr. McWhorter was appointed superintendent of equipment and overhead lines of the Memphis company, which position he held until April 21, this year, when he was made general superintendent.

Mr. McWhorter is a member of the Memphis Engineers' Club, the American Society of Municipal Improvement, the Memphis Chamber of Commerce and the American Electric Railway Engineering Association. He has always been interested in the work of the last-named body and in 1911 served as co-chairman of the joint committee on engineering accounting, interdepartment charges. At the convention of the A.E.R.A. in Chicago last October he was appointed a member of the committee on wheel tread and rail contours.

Mr. McWhorter was born in Madison, S. C., on June 3, 1877, but was reared in Atlanta.

Chicago Surface Lines Changes Announced

John E. Wilkie, assistant general manager Chicago Surface Lines, has been appointed assistant to the vice-president. He has been connected with the company since 1913 as assistant to the president and assistant general manager. He is also vice-president of the Chicago City Railway, one of the subsidiaries of the Chicago Surface Lines.

Michael Harrington has been appointed assistant superintendent of transportation. Mr. Harrington entered the service of the West Chicago Street Railway in December, 1884, as a horse car driver. In 1903 he was promoted to foreman at the Kedzie Avenue Depot, and at the time of the consolidation of the various companies in 1914 he was made division superintendent.

Joshua Burgee has also been appointed assistant superintendent of transportation. He has been connected with the Chicago companies in various capacities for thirty-eight years, beginning with the Chicago City Railway as a conductor in 1885.

R. M. Jenkins has been appointed division superintendent of the second division. He entered the service of the Chicago City Railway as a conductor in 1889. In 1905 he was promoted to the position of supervisor, which he held until June, 1918, when he was appointed assistant division superintendent at the Burnside Depot.

Andrew R. McDonald, South Kaukauna, a railroad engineer for twenty-three years, has been appointed by Governor Blaine as a member of the Wisconsin Railroad Commission to succeed Henry R. Trumbower, resigned. Mr. McDonald has been a road engineer for the Chicago & Northwestern Railroad since 1900. He was for four years legislative representative of the Brotherhood of Locomotive Engineers, vice-chairman of his railroad organization on the Northwestern system for six years and local chairman of his organization for sixteen years.

Mr. Reynolds Made Manager of the Washington-Virginia Railway

A. L. Reynolds, manager of the Youngstown & Suburban Railway, Youngstown, Ohio, under the management of Day & Zimmermann, has been transferred and promoted to general manager of the Washington-Virginia Railway at Washington, D. C., which property is also under Day & Zimmermann management. In his new post with the Washington-Virginia Railway Mr. Reynolds succeeds M. G. Stratton, who resigned on May 1.

Mr. Reynolds was appointed general superintendent of the Youngstown & Suburban Railway, Youngstown, Ohio, in March, 1921. Shortly thereafter he was made manager of the company. Before that Mr. Reynolds had been foreman of the Snelling car station of the St. Paul City Railway, included in the system of the Twin City Rapid Transit Company. He was in the operating department of the company for about twelve years.

A. L. Reynolds

Mr. Reynolds began his railway training in the operating department of the Northern Ohio Traction, Light & Power Company in 1907. The following year he took a position as salesman with the B. F. Goodrich Company, and after remaining with that concern for a year he again took up railway work with the operating department of the St. Paul City Railway as supervisor of transportation. Before the entrance of the United States into the war in 1917 Mr. Reynolds went to the Second Officers' Training Camp at Fort Snelling, Minn. He received there a commission as first lieutenant in the infantry.

Upon his return to civil life in 1918 he became identified with the Minneapolis Street Railway. During the latter part of 1918 he conducted for the company many public meetings in connection with its campaign to explain to the people the cost-of-service franchise which the company was seeking to obtain from the city.

In 1919 Mr. Reynolds was again transferred to the St. Paul City Railway by the Twin City Rapid Transit

Company, and while with that company he acted as supervisor and also in various other capacities. Mr. Reynolds was born in 1886 in Ashland, Ohio. He received his education in the grade schools of Akron, Ohio, and later attended Kenyon Military Academy at Gambier, Ohio. He is a graduate of Kenyon College, also in Gambier.

Philadelphia Newspaper Man Appointed to Pennsylvania Bureau

J. S. Stewart Richardson, formerly city editor of the Philadelphia *Public Ledger*, has been appointed director of its bureau by the recently formed Committe on Public Utility Information for the State of Pennsylvania. The temporary committee was headed by P. H. Gadsden, vice-president of the United Gas Improvement Company and former president of the American Electric Railway Association. For the present, at least, Mr. Richardson will make his headquarters at the office of the U. G. I. in Philadelphia.

Mr. Richardson is fairly well known to newspaper men throughout the entire State and is intimately known to the Philadelphia editors and the other newspaper men all along the line. He was born in England, and during the World War served as a Major in the forces of the U. S. A.

Officers Elected for Companies at Pottsville

The Eastern Pennsylvania Railways on March 26, 1923, was merged with its subsidiaries into the Eastern Pennsylvania Power & Railway Company. This company is located at Pottsville, Pa. Its officers are as follows: President, J. H. Pardee; vice-president, J. K. Choate; vice-president, R. W. Leigh; vice-president, J. I. Mange; secretary and treasurer, T. W. Moffat. The East Penn Electric Company, which holds approximately 99 per cent of the outstanding stock of the Eastern Pennsylvania Power & Railway Company, and into which the Eastern Pennsylvania Power & Railway Company will shortly be merged, has the following officers: President, J. H. Pardee; vice-president, J. I. Mange; vice-president, J. K. Choate; secretary and treasurer, T. W. Moffat.

Julian C. Smith Succeeds E. A. Robert at Quebec

Julian C. Smith has been elected president of the Quebec Railway, Light, Heat & Power Company, Quebec, Que., succeeding E. A. Robert. Several of the old directors resigned and their places filled by officials representing the Shawinigan Water & Power Company.

Samuel Cochrane has been promoted to the position of superintendent of maintenance of the railway department of the East Penn Electric Company, Pottsville, Pa.

Interstate Commissioner Goes to Yale

Winthrop M. Daniels Has Been Selected to Occupy Chair on Transportation at New Haven

Announcement was made in Washington on May 17 that Winthrop M. Daniels, Interstate Commerce Commissioner, will become professor in the Strathcona School of Transportation, Yale University. Since its receipt a few years ago of the endowment for this school under the will of the late Lord Strathcona, Yale has been planning the organization of a faculty to teach transportation. Its present staff includes Professor Dudley, formerly with the Westinghouse Air Brake Company, on the mechanical engineering side of transportation, and Charles J. Tilden on highway transport. Mr. Daniels' work will be confined largely to public policy toward transportation utilities, including in these utilities steam railroads, bus and truck transportation, electric railways, inland water transportation and transportation by air. In his second term, Mr. Daniels expects to take up a special course in the valuation of utilities and a course for graduate students on regulation of utilities.

Mr. Daniels is a native of Ohio and a graduate of Princeton University, where he was professor of political economy from 1892 to 1911. In the latter year he resigned to become a member of the Board of Public Utility Commissioners of New Jersey, on which he served until he was appointed in 1914 a member of the Interstate Commerce Commission. In 1918-1919 he was chairman of the Interstate Commerce Commission. He is the author of a number of books on financial and other topics. His resignation as a member of the Interstate Commerce Commission becomes effective July 1. The President has designated Frank McManamy as his successor.

Jason C. Leighton has been made vice-president of the El Paso (Tex.) Electric Company, to succeed Donald C. Jewett. Mr. Leighton is located in Boston at the main office. The other vice-presidents are Norman W. Mumford and Joseph Remick.

Samuel H. Sarena, formerly superintendent of transportation of the New York & Queens County Railway, New York, N. Y., has accepted the position of superintendent of the railway department of the East Penn Electric Company, Pottsville, Pa.

George B. Reamer, auditor of the Youngstown & Suburban Railway, Youngstown, Ohio, will act as manager of that company, succeeding A. L. Reynolds, whose appointment to the Washington-Virginia Railway at Washington, D. C., is noted elsewhere in this department.

Hugh Pattison has been appointed engineer of electric traction of the Virginian Railway, with headquarters at Norfolk. He comes to this position from the Illinois Central Railroad, with which for the past two years he has been engaged on preparation work for the coming electrification of the Chicago terminal.

Alvin Coffman has been appointed claim agent for the Chicago & West Towns Railway, with offices at Oak Park, Ill. His appointment became effective on May 1. Mr. Coffman is a native of Philadelphia. He first engaged in electric railway work in Roanoke, Va., where for a number of years he served as superintendent of transportation and claim agent. Later he assisted in establishing and conducting a joint claim adjusting bureau in Dayton for the City Railway, the People's Railway and the Oakwood Street Railway. He resigned from the service of the companies in Dayton to engage in war work.

Obituary

John M. Egan

John M. Egan, seventy-five years old, former president of the Metropolitan Street Railway and the Kansas City Light & Power Company, Kansas City, Mo., dropped dead on the stage of the new Amboy, Ill., Township High School Auditorium on the night of May 9.

Mr. Egan, who was reared in Amboy, had just concluded his number on the program, having recounted his schooldays in Amboy and recited five verses of Longfellow's "Psalm of Life." It is believed the excitement brought on a heart stroke.

He started his railroad career as a boy in the shops of the Illinois Central at Amboy about sixty years ago. Several years later he went to St. Louis, Mo., as assistant engineer of the Southern Missouri Railroad, and later to Lacrosse, Wis., as chief engineer of the Southern Minnesota. He also served as president of that road. A few more years found him general superintendent of the Western Division of the Canadian Pacific, then under construction from Winnipeg west. He also helped to construct the Great Northern from Minot, N. D., to Helena, Mont., a distance of 1,200 miles. Later he was general superintendent of that road and subsequently president of the Great Western.

Going to Savannah, Ga., he became president of the Georgia Central, but after a brief stay went to Kansas City, Mo., to become president of the company that built the new Union Depot there. From Kansas City he went to South America to take the vice-presidency of the Brazil Railway. Two years later, or in 1910, he returned to Kansas City as president of the Metropolitan Street Railway and Kansas City Light & Power Company. After six years of strenuous work in that position he retired in 1916 and returned to Amboy.

Mr. Egan was born in Springfield, Mass. His wife, three sons and two daughters survive him.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

$1,800,000 Car Contract Contemplated

Pacific Electric Railway Proposes to Order Fifty All-Steel Interurban Cars

The Pacific Electric Railway, Los Angeles, Cal., has announced that fifty new all-steel interurban passenger cars will be purchased immediately at a total cost of $1,800,000, each car to cost $37,000. Bids have been asked for the proposed new equipment and the earliest possible date of delivery specified.

The new cars each will seat sixty passengers and will be similar in type to the present all-steel interurban cars known as the 1,200 class now in service on the company's Long Beach and San Bernardino lines. End vestibules will be unusually wide and of the inclosed type, with double entrance.

During the past year the Pacific Electric lines have placed orders and had delivered more equipment, both passenger and freight, than for any similar period in the history of the company. With the order for the new interurban cars now being placed and 100 new cars for the Hollywood service, fifty of which are in service and fifty on order, the company, in the past year, will have contracted for 150 passenger cars, costing $3,687,000. Also for passenger service the company has contracted for a total of eighty-one motor buses, some of which have been delivered.

Regarding freight equipment on order delivery to the company has been partially completed on orders for 400 dump cars, 300 box cars, 150 flat cars and 10 electric locomotives, the total cost of which is $2,225,000, making passenger and freight equipment purchases total $6,562,000. The company states that the steady increase in population of all cities of southern California and the enormous growth of the Los Angeles harbor traffic have made these purchases necessary to keep pace with the industrial expansion.

Steel Contact Wire Discontinued

The Erie Railroad was one of the pioneers in electrification, having installed the Westinghouse single-phase system on the branch line between Rochester and Mount Morris in 1906. This work was done for the railroad by Westinghouse, Church, Kerr & Company (later absorbed by Dwight P. Robinson & Company).

The contact system is of the double catenary type, that is, there is a catenary "messenger" of steel in this case, a secondary supporting wire of hard-drawn copper, and a contact wire of steel. The last-named was added about ten years ago, but the railroad has now purchased Phono-electric wire for the 19-mile stretch between Rochester and Avon. The wire is on the ground and will be installed as soon as weather conditions permit.

$12,263,485 Net for Westinghouse

The statement of the Westinghouse Electric & Manufacturing Company submitted to the New York Stock Exchange for year ended March 31, 1923, shows net income of $12,263,485, after inventory adjustment, charges and federal taxes, equivalent to $8.19 a share ($50 par) earned on outstanding $74,812,650 combined preferred and common stocks (the two issues sharing alike in dividends after 7 per cent on the common). In previous year net was $5,837,389, or $3.80 a share. Property and plant are carried in the balance sheet at $50,055,473 compared with $39,347,074 in 1920.

World Stocks of Staple Commodities Are Lower

A recently published memorandum dealing with the world's stocks of fourteen staple commodities shows that in general the stocks were lower on Jan. 1, 1923, than at any other time in the last three years. This is particularly true of the commodities in demand by electric railways. The stocks of such metals as copper, lead and spelter are all very low. Tin, on the other hand, is fairly plentiful, and the stocks of rubber and crude oil have increased.

The results of the survey, which is the work of J. M. Keynes of Cambridge University, may be briefly summarized as shown in the table below.

A few figures for March 1, 1923, which are available show a continuation of the downward trend.

WORLD STOCKS OF STAPLE COMMODITIES

	Copper (Thousand Tons)	Tin (Thousand Tons)	Lead (Thousand Tons)	Spelter (Thousand Tons)	Rubber (Thousand Tons)	Crude Oil (Million Barrels)
Jan. 1, 1920	900	35	101	61	142	128
Jan. 1, 1921	822	27	72	81	207	134
Jan. 1, 1922	451	53	21	72	216	170
Jan. 1, 1923	319	38	1	17	248	248

Analyses of Samples and Delivered Coal Vary

Purchaser May Be Misled by Placing Dependence on the Former—Bureau of Mines Publishes Analyses

In using coal analyses it should be recognized that there is a decided difference between mine samples and samples from deliveries. Mine samples are important for determining the character of the coal in any given mine or district, and to the experienced purchaser they may serve as a sufficient guide in the purchase of coal. An average purchaser, however, may be misled by dependence on mine samples because the quality of coal indicated by the mine samples can rarely if ever be attained in the coal delivered.

Return to High Standard Difficult

Impurities eliminated from the formally prepared mine sample may not be eliminated in the production of large tonnage. If the roof and floor are friable or soft, pieces of them may be included in the coal shipped. When prices are high and competition is not keen it is easy for both the miner and the management to lower the standard of preparation of the coal, and the return to a higher standard is always difficult.

The Bureau of Mines has developed specifications for the purchase of coal that require a guaranteed analysis and contain premium and penalty clauses. A sample weighing not less than 1,000 lb. is systematically collected while coal is being loaded or unloaded.

Analyses Being Published

In using analyses of samples of delivered coal the reader must recognize that impurities are not uniform and some variation in the results obtained are consequently to be expected. When a considerable number of such analyses are available the average value and range of variation of a particular coal become known with assurance, and with allowance for variations, delivered coal can be sampled with sufficent accuracy. The Bureau of Mines is now publishing analyses of mine samples and delivered coal in a series of pamphlets by separate states.

Metal, Coal and Material Prices

	May 15, 1923
Metals—New York	
Copper, electrolytic, cents per lb	15.437
Copper wire base, cents per lb	19.00
Lead, cents per lb	7.175
Zinc, cents per lb	6.82
Tin, Straits, cents per lb	41.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$6.875
Somerset mine run, Boston, net tons	3.125
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.75
Central, Ill., screenings, Chicago, net tons	1.87
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft., cents per lb	7.75
Weatherproof wire base, N. Y., cents per lb.	19.25
Cement, Chicago net prices, without bags	$2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.16
White lead, in oil (100-lb. keg), N. Y., cents per lb	13.375
Turpentine, (bbl. lots), N.Y., per gal	$1.20

Rolling Stock

Moncton Tramways Light & Power Company has purchased and placed in service twelve new Birney safety cars.

Gary Street Railway, Gary, Ind., has ordered from the General Electric Company four car equipments with 265 motors and K-63 control and CP-27 air compressors.

Milwaukee Electric Railway & Light Company has ordered from the General Electric Company one hundred G-E 247 motors, which will be used on remodeled cars.

Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, suffered the loss by fire on May 10 of two passenger cars. Three other cars were damaged. The estimated loss is $40,000.

Indiana Service Corporation, Fort Wayne, Ind., has ordered from the General Electric Company ten four-motor 264 car equipment and CP-27 compressors for use on light-weight interurban cars.

Birmingham Railway, Light & Power Company, expects to purchase twenty new cars as a result of the agreement reached with the city, of which mention is made at length elsewhere in this issue. The company also expects to remodel present rolling stock to meet requirements of the revised "Jim Crow" ordinance. This remodeling work will be done in its own shops.

Menominee & Marinette Light & Traction Company, Marinette, Wis., has announced that the four used cars which have been received from the Wisconsin Public Service Corporation at Green Bay for local use in Marinette will be overhauled, re-equipped and put into condition to be used as spare cars, replacing the old style trailers which were used during the summer.

Lake Superior District Power Company, Ironwood, Mich., has received its new rolling stock, orders for which were placed several months ago. The equipment includes four of the smaller type of cars and five of the larger. The smaller cars, for use on the local system, have a seating capacity of thirty-two and the larger cars, for use on the interurban system, have a seating capacity of sixty-four.

Los Angeles Railway has placed an additional order for twenty-five steel cars with the St. Louis Car Company. The cars will be of type "H," similar to the seventy-five already in operation in Los Angeles. Fifty cars were ordered at the first of the year for delivery this summer. The additional twenty-five cars are scheduled to be delivered next fall. While the seventy-five new cars are being built in the East, the Los Angeles Railway has started a program for construction of fifty-five type "H" cars in its own shops. The work on the first car has been begun, but the greater part of the program will be carried out in a new mill building which will house forty-five cars. The type "H" cars are 48 ft. long and seat fifty-four passengers. They are equipped with cross seats throughout and have an inclosed center section and open sections at both ends. They are equipped for operation as single units or in two-car trains.

Track and Roadway

Windsor, Ont.—Mayor Wilson has signed the by-laws authorizing the expenditure of approximately $1,000,000 to rehabilitate and build extensions to the electric railway.

Montreal Tramways will soon proceed with the double-track extension on Rosemount Boulevard between Papineau Avenue and First Avenue, Rosemount.

Erie Railroad, Rochester, N. Y., is planning to extend its electric line from Mount Morris to Dansville and from there into Hornell. It is reported that most of the rights-of way for the new line between Dansville and Hornell have already been secured.

Milwaukee Northern Railway, Cedarburg, Wis., is being urged by the Green Bay Advancement Association to extend its trackage to North Milwaukee. This organization has also asked for the double-tracking of the company's line on Atkinson Avenue between the Green Bay Road and Eighteenth Street.

Wisconsin Railway, Light & Power Company, Winona, Minn., following the completion of track improvement work on the north side of La Crosse will be at liberty to begin work on track improvement work on Main Street. It is the plan of the company to double-track this downtown street from Seventeenth to Twenty-third Street.

San Antonio, Medina Lake & Western Railroad, San Antonio, Tex., will soon start construction of the line which will open up a modern and up-to-date summer and winter resort at Medina Lake, 40 miles west of San Antonio. It is the company's intention to operate gas-electric interurban service between these two points. At a later date the company will also consider the construction of an electric line between San Antonio and the Lake. The gas-electric interurban service planned by the company is in conjunction with its proposal to build a standard gage steam railroad from San Antonio northwest to Sonora and San Angelo, a distance of 274 miles, passing through the towns of Rio Medina, Utopia and Rock Springs.

Shops and Buildings

Columbus, Delaware & Marion Electric Company, Columbus, Ohio, have let contracts for the construction of a boiler of 1,000 hp. at its power plant in Scioto.

Denver Tramway is installing two 10,000-kw. turbines in its Fourteenth and Platte Streets plant. When installed the plant will have a capacity of 30,000-kw.

Cleveland Railway will build six new automatic substations, according to Joseph H. Alexander, vice-president. The total cost of these new stations will be $1,500,000 and will increase the number of automatic substations in Cleveland to nine. A contract has been made with the Westinghouse Company for the equipment for two of the stations that are to be built immediately. As soon as the new stations are completed, the Cleveland Railway will purchase all of its power from the Cleveland Electric Illuminating Company, from which it is now receiving approximately 80 per cent of its current.

Trade Notes

Arthur C. Sullivan, formerly connected with the Rail Welding & Bonding Company, Cleveland, has been made special representative for the Holland Trolley Supply Company, Cleveland.

George Macnoe, manager of the Boston office of W. B. Connor, Inc., has been recalled to New York to take charge of the contractors sales department, handling heating and pumping equipment.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., recently announced personal changes: C. W. Jones has been appointed general foreman of the controller department. C. A. Fike has been appointed general foreman of the coils and insulation department. J. H. Hartman has been appointed general foreman of the storekeeping department. W. S. Oswald has been appointed general foreman of the railway motor department. All these departments are located at the East Pittsburgh works.

Conveyors Corporation of America, Chicago, announces the appointment of the Pittsburgh Machine Products Company, Oliver Building, Pittsburgh, as district representative. The Pittsburgh organization will handle the sale of American steam jet ash conveyors, air-tight doors and cast-iron storage tanks in western Pennsylvania and the northwestern part of West Virginia. The Pittsburgh Machine Products Company is an organization of experienced ash disposal engineers, having handled the sale of Green steam jet ash conveyors, full rights to which were recently purchased by the Conveyors Corporation.

Johns-Pratt Company, Hartford, Conn., announces that arrangements have recently been made with the Curtin Mill Supply Company, Houston; Globe Supply & Machinery Company, New Orleans; Hide, Leather & Belting Company, Indianapolis; Hardy & Dischinger, Toledo; Rathbun Company, El Paso; the Miller Supply Company, Huntington; Walworth-Ohio Company, Cleveland, and the Wayne Belting & Supply Company, Fort Wayne, as distributors of its power plant specialties, vulcabeston products, including compressed asbestos red fiber sheet packing, asbestos valve stem and rod packing, asbestos air pump packing, asbestos pump valves and asbestos valve disks.